

April 12, 2007

MEMORANDUM

UTAH DEPARTMENT OF TRANSPORTATION

TO: Jim McMinimee, P.E., Chairman

FROM: Barry Axelrod
Recorder, Standards Committee

SUBJECT: Standards Committee Meeting Minutes and Next Meeting

The next meeting has been scheduled for Thursday, April 26, 2007 at 8:00 a.m., in the main 1st floor conference room of the Rampton Complex.

Item	Remarks	Sponsor
1. Minutes of February 22, 2007	For approval	Barry Axelrod
2. Supplemental Specifications, General Provisions. See listing.	For approval	Karl Verhaeren
3. Supplemental Specifications, Embankment Related. See listing.	For approval	Karl Verhaeren
4. Supplemental Specification 01452, Pavement Smoothness	For approval	Karl Verhaeren
5. Supplemental Specifications deleting Current Standards. See Listing	For approval	Karl Verhaeren
6. Deletion of Standard Specifications, 2008 Standards. See listing.	For approval	Karl Verhaeren
7. Supplemental Specification 02455, Driven Piles	For approval	Darin Sjoblom
8. Supplemental Specification 02466 Drilled Caisson, (Title change to Drilled Shafts)	For approval	Darin Sjoblom
9. Supplemental Specification 02721, Untreated Base Course	For approval	Tim Biel
10. Supplemental Specification 02746, Hydrated Lime	For approval	Tim Biel
11. Supplemental Specification 02785, Chip Seal	For approval	Tim Biel
12. Supplemental Specification 03575, Flowable Fill	For approval	Tim Biel
13. Standard Specification Updates for 2008. See listing.	For approval	Ming Ming Jiang
14. New Standard Specifications for 2008. See listing.	For approval	David Deng
15. Supplemental Specification and Supplemental Drawings, FG Series. See Listing.	For approval	Paul West
16. Supplemental Drawings, GW Series. See Listing	For approval	Wes Starkenburg
17. Rumble Strips (Action Log). See Listing.	For approval	Robert Hull John Leonard
18. Supplemental Drawings, TC, Traffic Control Series. See listing.	For approval	John Leonard
19. Supplemental Specification, 02891, Traffic Sign	For approval	John Leonard

- | | | | |
|-----|---|----------------|---------------|
| 20. | Supplemental Drawings, DD, Design Drawings Series. See listing. | For approval | John Leonard |
| 21. | Specification Format Change | For approval | Barry Axelrod |
| 22. | Review of Assignment/Action Log | For review | Jim McMinimee |
| 23. | Meeting Improvements (on-going agenda item) | For discussion | Jim McMinimee |
| 24. | Other Business | For discussion | Jim McMinimee |

JCM/ba

Attachments

cc:

Cory Pope Director, Region One	Stan Burns Engineering Services	Robert Miles Standards
Randy Park Director, Region Two	Boyd Wheeler Bridge Design	Barry Axelrod Standards
David Nazare Director, Region Three	Karl Verhaeren Construction	Patti Charles Standards
Dal Hawks Director, Region Four	Tim Biel Materials	Shana Lindsey Research
	Richard Clarke Maintenance	Tracy Conti Operations
	Robert Hull Traffic and Safety	Anthony Sarhan FHWA
	Vacant Traffic Operations Control	Mont Wilson AGC
	Rex Harris Region 1, Preconstruction	Tyler Yorgason ACEC

Agenda Listing

Item 2:

- 00120 Bidding Requirements and Conditions (Title change from Instructions to Bidders)
- 00515 Contract Award and Execution (Title change from Award and Execution of Contracts)
- 00820 Legal Relations and Responsibility to the Public (Title change, added “the”)
- 01280 Measurement

Item 3:

- 02056 Embankment, Borrow, and Backfill
- DD 16 Embankment for Bridge Placement (new drawing)
- 02061 Select Aggregate (Previously deleted this Section)
- 02324 Compaction (Previously deleted this Section)
- 02330 Embankment (Previously deleted this Section)
- 02332 Embankment for Bridge (Deletion of Section)

Item 5: Sections for Deletion from current 2005 Standards

- 02226 Remove Concrete Slope Protection (Deletion of Section)
- 02749 Asphalt Driveway (Deletion of Section)

Item 6: Sections for Deletion for 2008 Standards

- 02338 Refinish Subgrade
- 02715 Hydrated Lime Treated Roadbed
- 02762 Plowable Pavement Markers
- 02773 Asphalt Concrete Curb
- 02966 Recycled Surface
- 02967 Surface Repaving

Item 13: Updates for 2008 Standards

- 02221 Remove Structure and Obstruction
- 02225 Asphalt Surfacing Removal

Item 14: New Section for 2008 Standards

- 02982 Bridge Concrete Grinding
- 03339 Precast Concrete Deck Panel

Item 15:

- 02822 Right of Way Fence and Gate
- FG 1A Right Of Way Fence And Gates (Wood Post)
- FG 1B Right Of Way Fence And Gates (Wood Post)
- FG 2A Right Of Way Fence And Gates (Metal Post)
- FG 2B Right Of Way Fence And Gates (Metal Post)

Item 16:

GW 5A	Pedestrian Access
GW 5B	Pedestrian Access
GW 5C	Pedestrian Access

Item 17:

PV 8	Rumble Strips Centerline Application
06C-17	UDOT Policy, Use of Rumble Strips draft (Action Log)

Item 18:

TC 1A	Construction Zone Channelization Devices
TC 1B	Construction Zone Signing
TC 1C	Work Zone Advanced Warning Arrow Panels (New drawing)
TC 1D	Delineator Mounted Work Zone Sign Bracket (New drawing)
TC 2A	Hazard Mitigation (New title changed from Traffic Control General)
TC 2B	Notes (New title changed from Traffic Control General)
TC 3A	Standard Work Zone Signing General (Replaces TC 3, Traffic Control Project Limit Signing)
TC 3B	Reduced Speed Work Zone Signing General (New drawing)
TC 3C	Traffic Control Project Limit Signing (New drawing)
TC 3D	Work Zone Specialty Signs (New drawing)

Item 20:

DD 14A	Typical Rural 2 Lane Road 'Tee' Intersection (High Speed)
DD 14B	Typical 2 Lane Road 'Tee' Intersection (Low Speed)
DD 15A1	Typical Rural 2 Lane Road Intersection (High Speed)
DD 15A2	Typical Rural 2 Lane Road Intersection (High Speed) With Left Turn Acceleration Lane
DD 15B	Typical 2 Lane Road Intersection (Low Speed)

February 22, 2007

A regular meeting of the Standards Committee convened at 8:00 am, Thursday, February 22, 2007, in the 1st floor conference room of the Rampton Complex.

Members Present:

Stan Burns	Engineering Services	Member, Acting Chairman
Robert Miles	Standards and Specifications	Secretary
Barry Axelrod	Standards and Specifications	Recorder
Randy Park	Region 2	Member
Karl Verhaeren	Construction	Member
Richard Clarke	Maintenance	Member
Robert Hull	Traffic and Safety	Member
Tim Biel	Materials	Member
Boyd Wheeler	Bridge Design	Member
Rex Harris	Region 1, Preconstruction	Member
Erik Brondum	TOC	Member
Anthony Sarhan	FHWA	Advisory Member
Mont Wilson	AGC	Advisory Member
Tyler Yorgason	ACEC	Advisory Member

Members Absent:

Jim McMinimee	Project Development	Chairman
---------------	---------------------	----------

Staff:

Patti Charles	Standards and Specifications
Glenn Schulte	Traffic and Safety
Mike Donovan	Traffic and Safety
Richard Hibbard	Traffic and Safety
Larry Montoya	Traffic and Safety
John Leonard	Traffic and Safety

Visitors:

Roland Stanger	FHWA
Justin O'Connor	3M Company, TSS Division
Todd Mac Gillvray	Transcor
Aaron Buchanon	Transcor

Standards Committee Meeting

Minutes of the February 22, 2007 meeting:

1. Minutes of November 30, 2006 meeting were approved as written.

Motion: Richard Clarke made a motion to accept the minutes as written. Seconded by Tim Biel. Passed unanimously.

2. Supplemental Specification and Supplemental Drawings, ATMS area (Agenda Item 2) - Presented by Todd Mac Gillvray and Erik Brondum.

Todd reviewed the submittal and said there have been some changes since the submittal was sent out. He said the main change was instead of running fiber and locate wire a different method would be used. He said he would go through the major changes to each Section. He said they met as a group over the last year or so to review and update their Sections. He added that he anticipates more changes in the future as some changes did not get done this time.

Todd said the submittal sheet only covers the major changes with all the details in the comment logs. He commented on some of the changes to Section 13551.

Discussion points were:

- Comments were made with respect to pot-holing and the transfer of risk.
- Referring to Section 13551, Article 3.6 on anchor bolts Boyd said he found no reference to sections regarding structural concrete or a description of where these anchor bolts are suppose to go. He asked if it is appropriate for anchor bolts to be in this section. Boyd indicated that additional information is needed if the requirement stays in this section. Todd said this section is meant to be general requirements and that it is in the other sections in more detail. Boyd said he doesn't see things he expects to see if covered by this section such as the class of concrete. Todd said they could look into that.
- Boyd said he didn't know if the plan was for this section to be referencing a number of bid items or if this is a specification that is there for other specifications to reference and payment taken care of with the other items. Todd said this is a general specification with the other sections referencing the measurement and payment.
- Karl said he had a couple of issues and comments. He referred to Article 2.1 on Documentation. He said it is odd to have articles for submittals referring to another article for submittals. He suggested that 2.1 be part of Article 1.5, Submittals.

- Barry asked why comments are coming up now from those who had no comments or no response during the submittal sheet coordination process. Karl apologized adding that some of these areas were something he just started looking at over the last two weeks. Barry said he brought up the subject not so much for this meeting, but for the rest of the year as they get ready for the 2008 version. Barry said with all the stuff coming to this meeting they will never get through everything if comments are not provided ahead of time, during the submittal sheet coordination process. Barry said everyone needs to work together on this or we will never be ready on time.
- Stan asked if the point is if we spend this meeting adding comments we will never get through this meeting let alone the entire process. Barry said that was correct. Barry said if it is something that has not been addressed and needs to, then we can discuss the subject, adding that the majority of the comments have to get done during the coordination process with the right people. Referring to Boyd, Barry said in that case his name was not on the submittal sheet when it should have been.
- Barry said the right people have to be in the coordination process so they have a chance to comment where in this case it looks like that did not happen. Barry said this applies all the time but more importantly for the rest of this year. Todd commented that those parts were not changed and were approved previously.
- Erik Brondum commented on the recent changes within the TOC and that he was brought in to replace Troy Peterson but has since moved to a different area within the region. Stan asked Erik if he could provide direction to the Transcor people.
- Stan went back to Barry's comments, adding that we have a lot of ATMS specifications on the agenda. Stan asked if we are going to be able to get through all those items today. Stan asked the Committee if we should be submitting comments before hand as suggested by Barry. Mont said comments should be before hand. Robert Hull said definitely before hand. Randy asked if the comments were on changes that are not part of the recommended changes. In the case of the Structures comments Randy said it looks like there were things in the previous version that needed to be adjusted and not part of the Transcor/TOC recommended changes. Todd said they just included everything in the specifications that were submitted this time because this one is a full replacement of the current version. Todd said for example there are no drawings being submitted that require a structural review this time around for the areas being changed.
- Randy said what we have today is just a modification of these sections not a complete review of the specification. He said if that is what we want then we need to go back and do that.

- Stan said we have spent a lot of time just on the general requirements and that we need to speed it up.
- Todd went on to introduce the other items.
- For Section 13552 and drawing Todd said these were updated to add two vehicles per green.
- For Section 13553 Todd said the change was to remove the locate conduit and place a locate wire in each individual conduit.
- For Section 13554 Todd said the bolt type was updated as was the flowable fill requirements. The associated drawing was also updated.
- For Section 13555 Todd said the change was to clarify the location of the cabinet in relation to traffic for better protection of the cabinet.
- For Section 13561 Todd said the change allows for more options for locks and to increase the requirements for copper conductor.
- For Section 13591 Todd said the change allows the performance of the Local Field Operations Test after the opening of all lanes to traffic, clarifies sealant installation, and requires the loop sealant to cover the lead in wires as well as the loop.
- For Section 13592 Todd said the change clarifies what the contractor will do and what the Department will do. He said it also identifies the required fence and gate and describes the submittal and notification time requirements.
- For Section 13594 Todd said the change requires that contractor label fiber “UDOT fiber” and removes receiving test.
- For Section 13595 Todd said the change removes the requirements for troubleshooting and altered the website reference for testing forms to send Contractors and Resident Engineers to a more direct location. Barry said they changed the web site information back to the original way it was shown in the specification. Comment indicated the change by Transcor was made to shorten the time to get to the forms.
- Barry stated that all references in all specifications are required to go to the same page, the Standards and Specifications References Web page. The links to the desired location can then be found from there. Barry said he talked to Todd earlier about this and put an annotation on the submittal sheet. Todd said at one point the forms were not available. Barry said that has been corrected. Barry said he has verified every link on the References Web page, updated those that were incorrect or broke, and indicated by date when that was done for each link.

- Moving to the drawings Todd said that for AT 2 - AT 5 the option for two vehicles per green was added. He said AT 3 was replaced by AT 3A and AT 3B in order to show the additional signs. He said the signal head height was adjusted to conform to the MUTCD. Additional notes were added.
- For AT 6 Todd said the change included a statement about using flowable fill around all junction boxes at exposed areas.
- For AT 7 Todd said the change removed the bold sizes. He said the change also allowed for compactable native soil as well as Granular Backfill and removed the load ratings and terminal blocks. He said we do not wrap wire around ground rod. Todd said the change also required that new conduit be aligned by color on each side of the junction box.
- For AT 8 Todd said the change shows the direction of traffic relative to the cabinet orientation.
- For AT 9 Todd said the change increased the conduit size into the disconnect and transformer per Rocky Mountain Power's new guidelines. He said the change also switched the position of the transformer and the disconnect.
- For AT 15 - AT 17 Todd said the change update the notes and cleaned up the drawings to be consistent with the specification changes and other drawings.
- For AT 18 Todd said the change added an extra lane to traffic to account for wider freeways in both directions.
- Stan proposed going to the start of the specification changes to see if there are any comments.
- Referring to Section 13551, Article 3.4, Weed and Erosion Control, Karl said this article should be removed because it is covered by a Special Provision and is not needed here. Todd said a lot of times the contractor is not familiar with the other sections and requirements. Karl asked the Committee if we just repeat these requirements and in how many sections. Todd said there are some requirements that are not in the other section. Karl asked which ones. Todd went on to explain. Karl then asked if those were not paid for separately.
- Karl said what he is struggling with is that other sections cover the requirements. Todd commented that it is a nice quick summary for the user to have the requirements here.
- Randy commented that we try to eliminate duplication so we do not have problems. He said contractors have to work with you (Todd) to make sure they are aware of the other specifications.

- Karl made the same comment on Article 3.7, Traffic Control, suggesting part of that can be removed.
- Stan moved on to Section 13552.
- Roland Stanger commented that the reference to MUTCD in Section 13552, Article 2.4, paragraph B could be removed. He said the sign size part can remain and that the drawing reference covers the remaining requirements.
- Stan commented that we have a lot of ATMS specifications and comments already on Section 13551. Stan asked if a motion and vote needed to be done on each section instead of one for all the sections so we do not forget what was discussed and what the motion should state. There were no dissenting comments. Stan then asked for a motion on the first section.

Motion: Karl Verhaeren made a motion to approve Supplemental Specification 13551 as discussed and modified. Seconded by Randy Park. Passed unanimously.

Stan moved back to Section 13552 and asked if there were any additional comments besides Roland's.

Discussion points were:

- Karl commented on 1.4 Submittals. Referring to paragraph B, Karl asked if all the items needed to be restated. There were no follow up comments.
- Tim commented about the removal of a lot of concrete callouts in this section. Todd said the Standard Drawing references cover this.
- Karl commented on a spelling error in Article 2.8, paragraph C.
- There were no additional comments on Section 13552.

Motion: Randy Park made a motion to approve Supplemental Specification 13552M as discussed and modified. Seconded by Tim Biel. Passed unanimously.

Stan then moved to Section 13553.

Discussion points were:

- Karl said Article 2.1, paragraph J was redundant and was not necessary.
- There was no follow up or additional comments.

Motion: Robert Hull made a motion to approve Supplemental Specification 13553 as discussed and modified. Seconded by Richard Clarke. Passed unanimously.

Stan moved to Section 13554.

Discussion points were:

- Karl commented on Article 1.3, References and the placeholder for AASHTO H 20. Barry said he put that there because of the call out in Article 2.2, paragraph B. Barry said he did not have an “H” in any of his manuals so he could not put a title there. Barry said that needs to be corrected. Todd said it is for the loading. Boyd said the reference then needs to be to the specification where that loading is defined. Todd said that part was not a change and was previously approved. Boyd said it is an AASTHO bridge specification. Todd said that could be added. Barry checked the current Standard and Supplemental Specification and said the reference was not in any of them so it must have been added since the last approval.
- There were no additional comments.
- **Post meeting follow up:** Todd indicated he changed Article 2.2, paragraph B, to change the loading reference from H 20 to HS 20. It is not in section 1.3 because it is in ASTM C 857 which is already referenced. Tier 22 loading is not found in C 857 so it was removed.

Motion: Tim Biel made a motion to approve Supplemental Specification 13554 as discussed and modified. Seconded by Robert Hull. Passed unanimously.

Stan moved to Section 13555M.

Discussion points were:

- Tim commented on the concrete call outs, one in Article 2.1, paragraph A and the other in 3.2, C. He thought it was redundant. Todd explained but the comments were blocked out by other conversations. There did not seem to be a modification that was required.
- There were no other comments.

Motion: Richard Clarke made a motion to approve Supplemental Specification 13555M as presented. Seconded by Robert Hull. Passed unanimously.

Stan moved to Section 13561.

Discussion points were:

- Karl commented on the submittals as referenced in Article 1.4, paragraph A. Based on earlier comments he asked if they all apply to this section. Todd said no, but would have to check. Karl thought just those applying should be listed.

- There were no additional comments.

Motion: Boyd Wheeler made a motion to approve Supplemental Specification 13561 as discussed and modified. Seconded by Tim Biel. Passed unanimously.

Stan moved to Section 13591M.

Discussion points were:

- Stan commented on the change in depth of the cut in Article 3.3, paragraph F. He asked what that was based on. Todd said the change was to clarify the procedure. Stan asked Tim if 3 inches is deep enough based on the failure rate of the loops. Some of the comments were not understandable.
- Stan asked if Traffic and Safety was happy with the loops as they are and the failures. Robert Hull said they need to look at the best alternative and retrofit depending on the circumstances. Robert said the biggest issue is that there are a lot of failures and it basically crashes their traffic management system. He said this is a public issue and that they have to be very diligent in what they are doing. He said if the loops are not getting filled correctly is that the loop specification. They have to figure exactly why it is happening and get it fixed.
- Barry commented about Article 3.2, paragraph E. He said other than the removal of the period after “ft” there was no change. That is editorial and did not have to be included in the change, but could stay in.
- There were no additional comments.

Motion: Richard Clarke made a motion to approve Supplemental Specification 13591M as discussed and modified. Seconded by Robert Hull. Passed unanimously.

Stan moved to Section 13592.

Discussion points were:

- There was no discussion.

Motion: Randy Park made a motion to approve Supplemental Specification 13592 as presented. Seconded by Tim Biel. Passed unanimously.

Stan moved to Section 13594.

Discussion points were:

- Barry asked about the item in Article 1.3 that he crossed out for Bellcore Testing not being in the section any longer. Todd agreed.

- Karl commented about the Submittals article, paragraph B. He asked if that requirement was something that was absolutely needed or if it is as requested. To clarify Karl asked if this is a hard and fast rule as to being required. Todd said this item had not changed and is required.
- Referring to Article 1.5, paragraph D, Karl said the OTDR requirement is repeated in 3.7 D. He wanted to know if it was consistent. He said the same applies for 1.5 E. He then asked if there is a Department Fiber Representative as indicated in that paragraph. Comment indicated there is a representative.
- There was no additional discussion.

Motion: Tim Biel made a motion to approve Supplemental Specification 13594 as discussed and modified. Seconded by Robert Hull. Passed unanimously.

Stan moved to Section 13595.

Discussion points were:

- Karl asked if the submittal for the 30-day burn test was part of the General Requirements. Todd said it was. Todd went on to clarify. He said this specification is not typically used a lot because the Department likes to do this part in house. Karl said he still wonders why the duplication. Todd went on to explain the testing with Transcor and the Department. Todd said the contractor does not usually do the integration. Karl was good with that.
- There was no additional discussion.

Motion: Robert Hull made a motion to approve Supplemental Specification 13595 as presented. Seconded by Richard Clarke. Passed unanimously.
Discussion moved on to the drawings.

Discussion points were:

- Referring to AT 2 Roland said the orientation of the signal in Detail C is different than what is shown in the MUTCD. He said it should be on the right side of the road, not the left. Roland said Note 1 indicates "Locate per MUTCD."
- There were no additional comments on AT 2. Stan suggested going through all the drawings before voting. There was no disagreement.
- Barry said for reference AT 3 is being deleted and AT 3A and 3B added. There were no comments on AT 3A or 3B.
- There was no discussion on AT 4.

- Discussion moved to AT 5. Barry made a general comment on this as well as several of the drawings, pointing out that some of the notes had been changed or were new, but had not been highlighted in the submittal sheet. Barry said references to the updated notes looked correct in all the drawings.
- There was no further discussion on AT 5.
- There was no discussion on AT 6 or AT 7.
- On AT 8, Barry said it looks like the plan view was completely redone but there was no indication of that on the submittal sheet. Todd said it was updated for the flow of traffic and the new location for conduit. Barry asked if there was anything significant in that part of the change. Todd said there were no significant changes to the plan view. There was no further discussion on AT 8.
- There was no discussion on AT 9, AT 15, AT 16, AT 17, or AT 18. Stan indicated that we were at the end of the AT drawings.
- Barry asked Todd a general question about an earlier phone conversation with respect to some of the drawings being pulled. Barry asked if that was not the case anymore. Todd said a few modifications were made to some of the drawings.

Motion: Robert Hull made a motion to approve Supplemental Drawings AT 2, AT 3A, AT 3B, AT 4, AT 5, AT 6, AT 7, AT 8, AT 9, AT 15, AT 16, AT 17, and AT 18 as discussed and the deletion of AT 3. Seconded by Randy Park. Passed unanimously.

- Barry then commented to Todd about using the files he sent them to make the final updates to include accepting all changes and turning off track changes. Barry also indicated the problem with the signatures on the drawings has been resolved. Barry also said the revision section of the drawings needs to be updated but that they would take care of that so needed changes are included as well as updating the dates. He said to make sure the rest of the changes to the specifications are made so that they are what you want.
- Barry asked Todd about the impact for the 2008 version because not all sections or drawings were covered today. Barry asked if these will be looked at again. Todd said they would only look at these again if problems come up. **(Post meeting note per phone call from Todd:** With the recent administrative changes in the Traffic Management area some requirements may change, requiring the approval and publishing of changes to the items approved at the February 22, 2007 meeting.)

Stan said he had a question for the Committee with respect to the 2008 Specifications. He said as you know we are rewriting the Specifications and as a result we are going to get other groups coming here for our approval. He asked if there is a more proficient way to handle the changes. Stan said he thought there will be an avalanche coming up soon. Stan asked if the Committee was happy with the process and if this was the most effective way to do this.

- Barry said the items today are going into the 2005 version but ones in the future may be just for the 2008 version and therefore will not be supplemental changes. Barry said to keep that in mind when changes are brought here.
- Robert Miles commented about possibly having meetings every month on an “A” and “B” track basis where each track was a two month cycle. He said there is a lot of work to be done to be ready for the 2008 version.
- Body commented that specifications coming here should fully address the entire section, not just parts. He said it does not make sense to have comments indicating only parts of the section were looked at.
- Robert Hull said if that is the direction we are taking then that needs to be communicated. He said we can’t go through the motions of trying to get comments and nothing comes back, then get into this meeting and get bogged down. He said if we are going to get through this then everyone here and anyone else needs to step up and do what they are suppose to do.
- Randy commented that there is no such thing as a prefect specification and every time we look at one there could be changes. Barry agreed. Randy went on to say that it is the Committee’s responsibility to look at every change and give it their blessing, adding that he hopes the comments would be little to none with all that happening before coming here. He said many of us may not be qualified to comment on certain areas, like the ATMS specifications earlier today. Randy said the “meat and potatoes” of the review happens well before this meeting. Barry agreed, adding that he hoped all the work is being done ahead of time, stating the example of how Structures is handling their review. He said they are doing a good job, meeting once a week to discuss specific sections and not just from their perspective. Barry said what Structures is doing needs to be done in other areas as well.
- Stan gave an example using his item that would be covered later in the meeting. He said they sent the item out for comments but did not receive any so therefore the item should pass. He went on to state there are holes in what he and John Leonard had done on this item.

- Stan said he talked to Jim about this and Jim said it is your (submitter or owner) responsibility to contact people by phone to follow up on the “no comment” issue. He said people might then have a comment when earlier they didn’t have time to write an email. Stan said he sees this all the time with submittal sheets being sent out for comment and then coming here with “no comments received” marked on the form. Stan said his boss (Jim) is telling him that is no longer acceptable. Stan said we should all take that stand and use the phone to follow up with people having not provided comments.
- Someone asked how much time is that going to take. Stan said taking his item for example you should have lots of questions because it is so radical. Stan asked how we get this out to the groups that they can not just rely on sending out the submittal sheet for comment without follow up.
- Robert Hull said that we need to make sure everyone who is working on issues whether UDOT or not knows that we ought to be including individuals other than those listed on the Standards Committee Web site. Barry said when an item is being prepared and before it goes out for coordination the person preparing the change usually contacts him for assistance, but not all the time. Barry said conversations this week have addressed the coordination issue and who to contact. Barry said if the person contacts him before sending out the forms for the coordination process he tells them to send it to all four regions so that they coordinate with Preconstruction to include designers and project managers, Maintenance, Construction, and Materials. Just contacting these key people is good and if it applies to their area let them coordinate with those under them. Barry said that way at least all four regions get a look and all major areas are covered. Barry said in some cases he has seen email go out for coordination with certain groups omitted. Barry said he can then get back to the person to let them know they forgot someone.
- Barry said his point is for the Committee to let their people know that as they are going through the process to coordinate with the Standards Section. Barry said to make sure he sees the recipients so areas that are missed can be caught. Stan said in his example it goes back to him to follow up. Stan says he knows people are interested and probably didn’t have time to respond so it is incumbent on him to follow up.
- Robert Hull said he was concerned that for those who have not contacted Barry will come in here and we will have this discussion on submittals again. Karl asked what submittals are we talking about. Robert said for something you are working on to bring here so we do not have to have this big discussion every time. There seemed to be some confusion on what we were discussing when referring to submittals. Robert was referring to the submittal sheet as was Stan with respect to coordinating changes brought to the Standards Committee. It seemed that Karl was thinking more about the submittals required in a contract. That is not the issue in this discussion.

- Karl went on to discuss the contract submittal requirements and how they are spelled out in many different ways and locations within the specifications. Karl did go on to say that he didn't think the process was all that bad, just that the Committee seems to be reactive and instead of proactive in most cases. He said we look at things that are brought to the Committee but are not actually delegating work out. Karl said he is almost suggesting that is not a bad thought.
- Karl said the specifications are all "moving targets" where in crunch time you can not review all your specifications and come up with a good set of 2008 Standards. He said everything is changing as we go. Karl said every time you look at one you are going to find something else to fix. He said everyone is busy and this may not be their highest priority. He added that his focus has been diverted the last few weeks.
- Karl said we impose these policies on ourselves and then FHWA looks to us to see if we are abiding on what we say we are going to do. Karl said we have so many things that are not essential in his opinion, but show up that way.
- Stan recapped his comments and proposal. He said he didn't believe he could get off with a "no comment" on his submittal sheet. In his case he said he submitted something throughout the entire Department and got no comments back. Stan said that is impossible and not acceptable to bring something like that to this Committee. Stan said we could get a lot more done if we got on the phone and called those who should have commented on the item. Stan proposed that we look at that issue. Mont said it is not your fault that people don't have comments. Someone said there is a difference between "no comment" and "no response."
- Tim said we are looking more at someone who doesn't get to the item and therefore does not provide a response as opposed to someone who reviewed the item and sends back a reply that they have no comments.
- Barry said he didn't think we needed to formally change the process. He said all members are here except for Jim. Barry said based on the discussion today everyone now knows what needs to be done.
- Randy commented that Stan was right on track. Randy said most of us were here when the submittal sheet was developed and no one thought people would get off the hook by saying "I've sent something out by e-mail." He said we have gotten pretty lackadaisical in our world today. He said if we don't get a response right back we get upset. Randy said that was never the intent, adding that if you are the owner then you better do the leg work and talk to your stakeholders. Randy said when they deal with public involvement they never sit there and wait to be contacted. He said that is never satisfactory. Randy said he didn't think we needed to formalize anything, suggesting a re-education process of what the submittal sheet form is for.

- Stan said the purpose is to talk to as many of your customers as possible so that you build the best package and then bring it to this Committee. He said the Committee can then take a quicker looker at the item before saying yes or no.
- Robert Hull said each of us has the responsibility to contact each of the owners who sign off on the item. He said if we then come in here and pick it apart no matter what the other stakeholders said then we get hung up here.
- Randy said we can't be experts in every area so we look at the submittal sheet and who looked at it and put our trust in them. Commenting with respect to the ATMS items Randy said he doesn't want to be on the list of those commenting because he is not an expert in that area but he does want to see the list and if they made comments.
- Stan said there are two options. He said one is to add the Standards Committee members to the submittal sheet and the other is to leave it as is. Robert said anything that comes out of his area will include the members. Karl said he has already been doing that. Richard Clarke commented that we could give them the opportunity to comment. Karl said he didn't think we needed to change the form.
- Barry said that for example if Glenn or John were preparing something he would expect that they would work with Robert to make sure he agreed. Robert said that was not what he meant, saying that he meant like Randy for example. Robert said you bring an item here thinking you have gone through everything only to have it trashed. He said in that case someone obviously missed something and this Committee is the final say. He said regardless of what the process is, he would hedge his bet and make sure everyone on the Committee had a look before the item comes here. He said that way issues can be dealt with before coming to the meeting.
- Stan suggested that if an item comes here for approval and "no comment" is indicated throughout the submittal sheet then they have the person go back and contact the stakeholders for comment. Barry said they can look at that as the sheets come to them for inclusion in the agenda package. Barry said he does look through the sheets and has on occasion sent them back for more information. He said they can take it upon themselves to make sure "no comments" are justified and ask the person what they have done for the coordination. Barry said if they are going to do that then items need to come in on time, not at the last minute or late. He said in those cases there won't be enough time to get information back and still meet publishing deadlines.
- John said there is a definite difference between "no comment" and "no response." He said the main thing we are talking about is the "no response." John suggested that the e-mail ask for a response even if you have no comment and agree with the proposed change. He said we could qualify that so we know the person looked at it but did not have any comments.

- Someone asked about the October publishing date. Barry said the October date to approve items is the meeting date. Barry said the one thing he has mentioned several times is not to wait until the October meeting to bring an item for the first time and expect it to be approved and included in the 2008 version. If by some chance the item is not approved then it will not be put in the new version. Barry said given that the target should be the August meeting with the October meeting being just a clean up meeting. He said a straight forward item could come to the meeting for the first time in October, but do you want to take that chance.
- Robert Hull asked if every specification and drawing will be done by that time. Barry said while every one may not have to come here for review and approval he said they are hoping that every one is at least looked at so needed changes can be made. Barry said if every one had to come here they would never get done. Barry said some of the suggested changes he has already seen may be editorial and therefore do not have to come here for approval. Barry said to work with them to decide if changes are editorial or whether approval by the Committee is needed.
- Robert said he was asking the question as he was thinking about the schedule. Barry said that is why he is trying to get inputs back from each area as to what they are working on and what the changes might be. Barry said he has not gotten comments back from Maintenance even though he knows they are looking at a lot of specifications and drawings. Barry said each area needs to let them know what their schedule is so they can make sure everything is being looked at. Barry said the sooner they get the information the sooner they can determine if there is going to be a problem or a significant rush toward the end.
- Robert Miles asked every one to do there best to help with the “no comment” and “no response” issue.
- Robert Hull asked about the case where they may not have something to update for one of their sections, but another area might. Barry said they are trying to work that out by have people look at all sections and drawings not just their own. Barry said he has a list of people who have committed to help review all the sections and that he would like to get the Standards out to them for a complete look. Boyd said they are going through every Standard that they touch, directly or indirectly. Boyd said if they have comments to one owned by another area then they are sending the comments to them for review. Robert Hull said if they don’t hear something until September then they could be dead in the water. Boyd said they are trying to avoid that with a schedule that has them completing all reviews by the end of April.
- Stan said if there are no further comments then we should move on so the rest of the agenda can be completed.

3. Supplemental Specification 02765, Pavement Marking Paint (Agenda Item 3) – Presented by Tim Biel.

Tim said this one is straight forward, adding for a while Maintenance had a similar set of requirements. Tim said this version brings everything into line in one specification. He said this version also addresses the black paint issue. He said other editorial type changes were made. Tim indicated that some of the Minimum Sampling and Testing requirements were removed and put in the manual of instruction.

Tim then addressed some of the comments and changes in the submittal sheet.

Discussion points were:

- Tyler commented on the tolerances for bead and that the tolerance for calibration for paint was not initially in the recommended change. Tim said they were already looking at that and it can be addressed. Tim and Tyler discussed other items from the submittal sheet.
- Discussion continued on the meaning of “long term” as used in Article 3.4, paragraph B. Roland said long term is more than three days. Discussion also included the MUTCD and if the proper wording is included in the section. Tim said they would check that out and make sure it is correct.
- Randy asked if “long term” is used anywhere else in this specification and if more than three days is standard for “long term.” Tim said that is the MUTCD definition. Randy asked if that was reasonable to know that. Roland said there are a lot of things in the MUTCD that they need to know and that is one of them. Randy said he was fine leaving it the way it is. John said that terminology is used in other locations including the TC Series Standard Drawings.
- Stan asked Tim about the glass bead specifications being included in the paint specification. Tim said beads have always been incorporated in this specification, adding that many years ago it was called Pavement Marking Materials.
- Randy commended those who put this specification together. There was no further discussion on this item.

Motion: Randy Park made a motion to approve Supplemental Specification 02765 as discussed and modified. Seconded by Robert Hull. Passed unanimously.

4. Supplemental Specification 02754, Dowel Bar Retrofit and Supplemental Drawing PV 9, Dowel Bar Retrofit (Agenda Item 4) – Presented by Tim Biel.

Tim said a lot of miscommunication issues were corrected. He said the specification was updated to clarify requirements and reorder execution actions. For the drawing Tim said there was not a lot of change other than the addition of the notes and editorial updates to more accurately reflect the size and shape of the bar system and cut slots.

Discussion points were:

- Karl commented about the reference to the PDPL as opposed to the APL. Karl thought the APL would be more appropriate. Tim said he would have to ask Barry Sharp in Research. Tim said the way he understood the difference is that the APL lists products that currently meet UDOT Standards and the PDPL products that meet a national standard that we do not have a specification for. Tim said all it does is help the Contractor or Engineer understand the products, but project level approval is still needed for the product. Tim said the list eliminates the ground work of having to go out and find the information.
- Karl said his concern is that he didn't think the list was all inclusive. Tim said that is probably true. There seemed to be some confusion on the difference between the two lists. Tim said you won't find the same category on both lists adding that we either have a specification that covers it or we do not.
- For the drawing Barry suggested showing the text between the details as notes.
- Robert Miles commented about the description shown on the drawing. Tim explained the meaning.
- There was no further discussion on Section 02754 or PV 9.

Motion: Robert Hull made a motion to approve Supplemental Specification 02754 and Supplemental Drawing PV 9 as discussed and modified. Seconded by Richard Clarke. Passed unanimously.

5. Supplemental Drawing PV 8, Rumble Strips Centerline Application and UDOT Policy 06C-17 Use of Rumble Strips draft (Agenda Item 5) - Presented by John Leonard and Robert Hull.

John provided some history on PV 8. He said it was first brought to the Standards Committee about three and a half years ago. He said at that time there was a lot of discussion about the use of centerline rumble strips. He said since then it has been used as a detail sheet in projects. John said since then they have been waiting for two things, one being a study through UTRAC with BYU evaluating the use. John said the second was the completion of the policy to address shoulder and centerline rumble strips.

John said the drawing is now back for final review and approval. He said the only thing that changed on the drawing was to lower the speed from great then or equal to 50 to 45.

Robert said there were also some inconsistencies between the policy and the drawing. He said the included policy fixes that.

Discussion points were:

- Robert Miles and Stan commented about whether the policy has been approved or not and that there is some confusion. Stan said the process is for each group to develop policies for approval to the Technical Committee. Stan said they (Jim and Stan) are not sure that has taken place. Robert Hull said they have. Barry said it was several months ago that the first version was approved but there has since been changes that Jim was not aware of going through the Technical Committee. Robert Hull said that have not been any changes. John said the only changes were some clarification verbiage to match the drawing and the one from the Standards Section dealing with how the exception process works.
- John said the intent of the original policy was that if anyone was doing a Deviation from Standards it would have to come to the Complex for review and approval. John said the way it was worded in the policy was that Design Exceptions were approved by the Engineer for Traffic and Safety. John said the wording was changed to make it a Level 1 Deviation requiring coordination at the Complex and approval by the Department Preconstruction Engineer. John said the concept is the same, just that the wording was changed. John said this is essentially an editorial change.
- John said the rest of the input is for PV 8 to get it from a design detail to a Standard Drawing and doing what they were tasked to do by the Standards Committee to get the drawing through UTRAC and formulation of the policy. John said they are now asking for approval of the drawing.
- Stan said some people can't remember the policy going through the Technical Committee so they would like to review that. Stan said the policy has ramifications for the Department as to where rumble strip will or will not be placed and the speed limit.
- Robert Miles commented about placement and the speed limit requirement. He asked if we approve the Standard Drawing do we put rumble strips on every highway greater than 45 mph and not divided. John said no, that it was based on criteria in the policy and road accidents. Robert said there is no policy requirement to check that if the drawing is put into effect.
- Robert Hull commenting to Robert Miles and Stan said it looks like you have been given direction on this so he asked that approval be pushed to the next meeting so that issues can be resolved.

- John asked if any one had comments on the drawing to be included when it is brought back the next time. Boyd asked about the depth requirements, saying that he didn't see any on the sheet. John said it is covered by the reference back to PV 6. Barry said that is Note 3.
- Tim said he was confused about the comments on the drawing about spray on marking and pavement tape and what they are referring to. John commented that the drawing did not print out correctly.
- Tim also commented that this is more of a policy issue than an actual construction application. Someone commented that Notes 1 and 2 were more applicable to a policy, not a Standard Drawing.
- Stan said the item is tabled until the next meeting.

Action Item: Robert Hull to meet with Tracy Conti, Jim McMinimee, and Robert Miles to discuss the policy.

6. Supplemental Specification 02843, Crash Cushion (Agenda Item 6) - Presented by Glenn Schulte.

Glenn said verbiage was added to the specification as identified on the submittal sheet. He said all reference to 350 testing was removed because it is referenced in the Guidelines for Crash Cushion and Barrier End Treatment. Glenn said they need to reference the Guidelines to see what systems have been approved so there was no need to duplicate requirements in the specification. He said he coordinated this back in November and only received one response indicating no comment.

Discussion points were:

- Barry said the changes are included as part of a full Supplemental Specification because it has to replace one already approved.
- Karl commented that Article 2.1, paragraph A1a still had a reference to NCHRP 350 that seemed contrary to what Glenn just mentioned. Glenn said he made one reference to it under crash cushions and then removed it under all the types. Glenn said they want it in one place in the specification.
- There was no further discussion.

Motion: Randy Park made a motion to approve Supplemental Specification 02843 as discussed and modified. Seconded by Boyd Wheeler. Passed unanimously.

7. Supplemental Specification 02892, Traffic Signal and Standard Drawing SL 9, Pedestrian Signal Assembly (Agenda Item 5) – Presented by Larry Montoya and Richard Hibbard.

Richard said the specification has almost entirely been rewritten and that they have not had a lot of feedback. He also said the pedestrian button was updated on SL 9. He did say that one thing that is somewhat controversial is that under submittals they are asking that individuals performing wire splices be certified through the Department. He said this is an attempt to help solve the problem of some splices not working.

Discussion points were:

- Based on a question from Karl, Larry explained the splice process.
- Larry said he received some comments yesterday from Roland on FHWA inputs on the pedestrian button on the drawing. He said it involved the sheeting requirements. Larry said they have talked to all the vendors about the sheeting and the vendors are all able to provide the proper sheeting. He said he would have to talk to them about the higher grade Roland had referred to. Roland said he meant they could use any sheeting, asking why do we specify only lower sheeting and why don't we allow higher sheeting if that is what they want to provide. Larry said this refers to Article 2.7, paragraph D, dealing with the pedestrian button commenting that the requirement for Type III sheeting could be that or higher. He also referred to the MUTCD requirement in the same paragraph.
- Stan asked about the comments on the submittal sheet. He pointed out that under AGC and ACEC it showed no comments but that the submittal was also sent directly to some contractors and suppliers. Stan asked how that was done. Larry said they were working with some of them on other issues so they asked for feedback on this. Stan briefly pointed out the earlier discussion on the submittal sheets to Larry who was not present during that part of the meeting. Stan said just sending the item out for coordination may not be good enough and thanked Larry for the input.
- Tim asked a question with respect to asphalt and what they were trying to achieve. Larry asked if he meant the gradation. Tim said yes, pointing out they do not use maximum gradations any more, wondering if it was a carryover from the past. Larry commented about trenching, saying he didn't know if that would be a problem. Tim said the reason he brought it up was because of the reference to Section 02741, a paving specification. He said he didn't think anyone would actually be able to meet 02741. Tim suggested using a ½ inch or ³/₈ inch nominal mix instead of 02741. Larry said they can make that change.
- In Article 3.4, paragraph A, Tim commented about the same thing with respect to the asphalt reference and whether they meant the same thing as the previous discussion.

- Boyd pointed out that in Article 3.2, paragraph F, the best reference would be to drilled caisson with a reference to Section 02466. Boyd recommended reflecting that in this paragraph. Larry agreed.
- There was no further discussion.

Motion: Robert Hull made a motion to approve Supplemental Specification 02892 as discussed and modified. Seconded by Richard Clarke. Passed unanimously.

This item had two submittal sheets, one for the specification and one for the drawing.

SL 9 was covered next.

Richard said they are already getting comments about putting both signs on a single pole. Richard said Region 2 recommended putting one of the frames up side down and then mounting both signs. He said the buttons would remain at the appropriate height. He said another option is to do what is indicated in Note 4 and use two poles. He said that depending on the set up you may not want several pedestrian poles at an intersection. Richard said he could not find any documentation saying the sign had to be above the button. He said the preference is to have two separate poles.

Discussion points were:

- Tim asked if Note 4 was going to be changed. Richard said if you leave it open to orient the sign then that is what everyone will do and not the preferred method covered by the drawing. Richard said if that option is left off then hopefully you will get the preferred method.
- There was no further significant discussion.

Motion: Tim Biel made a motion to approve Supplemental Drawing SL 9 as presented. Seconded by Richard Clarke. Passed unanimously.

8. Retrofit Plate for Wire Loop Barrier (Agenda Item 8). Presented by Stan Burns.

Stan thanked Glenn and John for being present and helping with this item. Stan said this item came to his group several months ago on what to do with wire loop on Jersey barrier. He said in 1976 we gave contractors the option to use wire loop, but since 2001 we have not allowed wire loop on Jersey barrier. Stan said the reason is because the loop is rusting. He said the proposal is to retrofit all Jersey barrier that has wire loop.

Stan said his group looked at around 12 different ideas and presented those ideas to the Technical Committee a few months ago. Stan says the last sheet shows the proposed drawing. Stan said this would be a detail sheet. He said the Technical Committee didn't want to pass judgment on this, referring it to the Standards Committee.

Glenn asked if an approval is needed to go forward to use a detail sheet. He said if we are going to ask for approval on a detail sheet he has a ton of them that he uses as needed on projects or do we want to say this works so let's just run with it as a detail sheet. Glenn said if we approve this then we are making it a Standard and that is not what we want. Glenn said they want it as a project specific detail sheet. Glenn said they are trying to get feedback from the Standards Committee to see if this is going to work.

Recapping Glenn said the question is: Can this Committee live with this concept that we are trying to fix substandard Jersey barrier out there now that may not be functional when it is impacted.

Discussion points were:

- Boyd said he is comfortable with the concept but suggested adding beveled washers to the bolts so they are horizontal instead of perpendicular to the face. Glenn said they looked at that and during the test the bar was flexible enough that the bolt was pulled down to the proper position. Boyd suggested adding a note to drill the holes horizontally. Boyd said right now you show the bolts coming out perpendicular to the surface of the barrier and that bolt is not, it is coming out horizontal in the blowups of section A-A. Glenn said they would fix it.
- Boyd asked if there is a height down where this is to be ideally placed. Glenn said he thought they specified it at the break point but couldn't remember. Tim pointed out the dimension in section A-A. Glenn said 16 inches to the bottom bolt hole.
- Tim asked if any other options were considered instead of galvanizing. He said there are other type bolts like stainless steel that are out there that give you other options. Glenn said they had not thought about that. John said they skipped the stainless steel because of cost because of the 100,000 joints. John said the retrofit is for barriers that are not projected to be replaced as part of other projects.
- Glenn said this is already in a project in Region 3. He said that project will give them a better handle on the costs instead of the estimates they have now. Glenn said he thought his estimate was high.
- Being no other questions or comments on the drawing Stan moved on to another question. He said this is a fairly large impact. Stan asked, what is the responsibility of this Committee? Do you want to look at details like this?
- Stan said for example we have a large rehab project on I-215 this would be inserted into that project. Would that be based on a decision by the Technical Committee, the Standards Committee, or just us (Stan, Glenn, and John getting together and saying just do this)?
- Randy commented that he thought this would be a stand alone project.

- Robert Hull said he thought Randy and Glenn were both touching the issues. He said it is clear that the connectors out there are not adequate. He said for future projects there is a decision to be made as to either repair the connectors or replace the barrier with something else.
- Glenn said that when the current barriers are hit Maintenance is just sliding them back into place and not replacing the connectors. He said with this fix the ends of the barrier would be ripped out when hit and therefore would have to be replaced. He said their group understood that when they were meeting to come up with a plan.
- Randy said the one thing that concerns him that is out of the purview of the Standards Committee is the cost of retrofit. Randy added that he is good with the fix, but it would have been nice to be able to have some flexibility in the barrier when it is hit after the fix.
- Mont asked about the old wire mesh that was used to clean up and repair spalling on the old barrier. Stan said they had not considered that and had not looked at all the different conditions the barriers are in. Glenn said the thing they looked at was the location of the rebar so that it would be missed when the drilling was done. Glenn said that was how they determined where to put the holes. Glenn said they never addressed the outside condition. John agreed with Glenn.
- Glenn said the barrier they were looking at did not have backing like in some locations with sound wall along I-215. He gave examples that would apply. He said it would be up to the designer or area supervisor to say the barrier needs to be looked at. He said this needs to be done early in the design phase.
- Randy asked about half-barrier and whether the drawing needed to address that. Glenn said he didn't think so, adding that he has not seen a lot of barrier out there of that type with the wire loop. Glenn said even if it did there would not be a problem because of the backing with the half-barrier.
- Stan then got back to the main question, where should the decision be made to accept this kind of detail. Richard Clarke said something has to be done and we have come up with the best solution. Richard then said just do it. Stan asked if the Standards Committee should look at this kind of thing.
- Robert Hull said the one thing that could draw the line is that in this case this was an issue that was started by another group and that the Technical Committee thought it should come to the Standards Committee for review. Robert didn't think they said anything about changing their policy and procedure about approving this type of item. Robert said he thought they wanted a broader review because of the safety and fiscal impacts.

- The decision was made that regular project level detail sheets did not have to come to the Standards Committee. Stan suggested some kind of flow chart from the Standards Section. Boyd suggested that Robert (Miles) and Barry could look at the item and decide if it was something that had a state-wide impact and needed to come to the Standards Committee or can be handled on a project level. Boyd said taking all engineering decisions to this group is not someplace we want to go.
- Robert Hull said he would rely on Jim saying this is something impacting the entire Department and it is something we want to take to the Technical Committee, but we have to rely on the people doing the jobs to make those decisions and trust that.
- Barry said in this case it may be related to our Level 1 Deviation from UDOT Standards for traffic control or a significant safety issue. Barry said the ones that have this significant impact and if going through the normal project review of doing either a detail sheet or special provision we have the Deviation Process to decide if it is a Level 1, 2, or 3. If it falls in as a Level 1 like this one seems to be it is going to come to Robert Miles for the approval and review by Traffic and Safety. Glenn said that is a project basis issue. Barry asked if this would not cover it. Glenn said it would but this one has a big fiscal impact. Barry said someone has to make the determination and if not done then it should be caught during this process.
- Randy agreed with Barry adding that this type happens so rarely. Barry said if it is caught during the Deviation Process and it is far reaching then the recommendation could be to bring it to the Standards Committee.
- Stan said we have captured the comments and need to move on. Robert Hull asked about what will be taken back to the Technical Committee. Barry asked if approval is needed on a concept, not a drawing.
- Richard Clarke commented that we (Standards Committee) have reviewed this item.
- Stan moved on to the next agenda item. There was no formal motion or vote.

9. Review of Assignment/Action Log (Agenda Item 9)

Stan and Barry covered the Action Log

- Item 1, Rumble Strips. This item was discussed under Agenda Item 5. Approval was postponed and the item will be brought back to the April 2007 meeting for further consideration.

- Item 2, Three-Legged/ Four-Legged Intersection. Item removed from agenda as not ready. Barry said that this item and number 3 were suppose to be here for this meeting but were not ready. John said this one is out for review and they are checking on the stakeholders. Target date changed to April 2007 meeting.
- Item 3, Supplemental Specification 01554. Tracking changed from 00555 to 01554. Not ready for discussion and approval. John asked if this one had to go out to all the sponsors as well. The answer was yes. Target date changed to April 2007 meeting.
- Item 4, Review of Standard Sheets 1B and 1C, Index. Barry said the item is closed and the new Standard Drawing book has been published with all Standards Committee members getting a copy. Copies are also available for sale. Addressing Mont, Barry said he sent Rich Thorn at AGC an email to see if AGC wants to purchase any of the books. Barry asked Mont to follow up with Rich. Barry said all the drawing approved today will become Supplemental Drawings and be handled similar to Supplemental Specifications. Barry said the procedure is on the Web site.
- Item 5, Supplemental Specification 02765. Item presented and approved under Agenda Item 3. Item closed.
- Item 6, Supplemental Specification 02843. Item presented and approved under Agenda Item 6. Item closed.
- The status report as handed out at the meeting follows:

Action Item Update for February 22, 2007 Standards Committee Meeting

(As of February 6, 2007)

Item 1, Rumble Strips: New target date was set to February 2007 meeting during the November 2006 meeting. Scheduled on the agenda for approval of Supplemental Drawings PV 8 and to update the Committee and bring the policy into line with current Standard Drawings.

Item 2, New Drawing of Three-legged and Four-Legged Intersection: New target date was set to February 2007 meeting during the November 2006 meeting. Scheduled on the agenda. The drawings have been developed and out for coordination. Not ready.

Item 3, Supplemental Specification 01554M, Traffic Control: New target date was set to February 2007 meeting during the November 2006 meeting. Scheduled on the agenda. Also now being tracked as 01554, not 00555. Not ready.

Item 4, Review of Standard Sheets 1B and 1C, Index. Decision was that the sheets are no longer needed. A listing of all Standard Drawings with approval date are now included in all Project Table of Contents (TOC) files with the all parts of the TOC updated accordingly. Drawing changes will now be issued by Supplemental Drawing, similar to the issue of Supplemental Specifications. Procedures and the Web site have been updated. Supplemental Drawings that impact a project are now included in the Plan Sets (full size plan sheet projects) or TOC (8 ½ x 11 projects) by the designer. For the full size projects the drawings are added at the end of the Plan Set. For the other size projects the drawings are added after the Typical Sections or Detail Sheets. A hard copy book was also published with all approved changes through the November 2006 meeting included. An effective date of February 1, 2007 is in effect with a Priority 3 requiring the use of the new procedures after February 28. This item is now closed.

Item 5, Supplemental Specification 02765, Pavement Marking Paint: The item was due for the November 2006 meeting but was not ready. The target date was changed to the February 2007 meeting. On agenda for approval.

Item 6, Supplemental Specification 02843, Crash Cushion: New item following the November 2006 meeting. On agenda for approval.

9. Meeting Improvements (on-going agenda item) (Agenda Item 10).

Discussed during the meeting on the submittal sheet process and “no comment” replies and the lack of responses.

10. Other Business: None

A motion was made, seconded and approved to adjourn.

The next regular meeting of the Standards Committee has been scheduled for Thursday, April 26, 2007, at 8:00 a.m., in the 1st floor conference room of the Rampton Complex.

Approval of Minutes: The foregoing minutes were approved at a meeting of the Standards Committee held _____, 2007.

Assignment/Action Item Log

Date Initiated/Updated	Item #	Action	Assignments	Status	Target Date
June 27, 2002	1	Standard Drawing PV 8 (Rumble Strip)	Darrell to assign someone from Construction.	Open	February 2007 meeting
October 31, 2002			Richard Miller from Maintenance. Fred Doehring. Betty Purdie. Robert Hull to head the group.		
December 19, 2002		- Process being reviewed. Research looking into testing.	Robert Hull Stan Burns		
February 27, 2003		- A policy is to be developed over the next several months. (Original PV 8 reviewed)	Robert Hull Stan Burns		
April 24, 2003		- No change			
June 26, 2003		- No further updates. Target date changed.			
August 28, 2003		- Progress continuing. To work with Research.			
October 30, 2003		- Process continuing.			
December 18, 2003		- Still being worked.			
February 26, 2004		- No update			
April 29, 2004		- Jim to follow up with Research.			
June 24, 2004		-Research has study with University of Utah			
August 26, 2004		- Research study complete. Policy being written.			
October 21, 2004		- Waiting for BYU study results.			
February 24, 2005		- Still being reviewed. Target changed.			
April 28, 2005		- No change			
June 30, 2005		- No one present to discuss.			
August 25, 2005		- QIT working on a policy. Item being tracked as Rumble Strip Policy.	Traffic and Safety - Robert Hull		
October 27, 2005		- December meeting canceled. Target date updated.			

Date Initiated/Updated	Item #	Action	Assignments	Status	Target Date
February 23, 2006	1	Item continued. Standard Drawing PV 8 (Rumble Strip) - Policy approved. Drawing to be completed.	Traffic and Safety - Robert Hull		April 2007 meeting
April 27, 2006		- Policy approval discussed. Never brought to Standards for review and approval.			
June 29, 2006		- Committee still needs to review the policy			
August 31, 2006		- No change in policy review requirement. Drawing needs to be created or current drawings updated.	Steve Anderson (drawings)		
November 30, 2006		- Item to be reviewed and updated to be consistent with Standard Drawings.	Robert Hull		
February 22, 2007		- Supplemental Drawing PV 8 and Policy on agenda. Discussed but not approved. Will be brought back to the next meeting. Robert Hull to meet with Tracy Conti, Jim McMinimee, and Robert Miles to discuss the policy.			

Date Initiated/Updated	Item #	Action	Assignments	Status	Target Date
August 28, 2003	2	A new drawing depicting the three-legged/four-legged intersection to be developed.	John Leonard	Open	April 2007 meeting
October 30, 2003		- No change in status.			
December 18, 2003		- Target date set.			
February 26, 2004		- No change.			
April 29, 2004		- Being developed			
June 24, 2004		- No report. Not due until August. E-mail sent to SAF and RES.			
August 26, 2004		- No change except target date.			
October 21, 2004		- Still under development. Target date moved.			
February 24, 2005		- No change. Work priorities prevented further review.			
April 28, 2005		- No change			
June 30, 2005		- No one present to discuss.			
August 25, 2005		- Looking at three-legged intersection first.			
October 27, 2005		- Not due. No action required.			
February 23, 2006		- Reviewed by the Traffic Engineering Panel. Drawings being developed.	Richard Miller		
April 27, 2006		- Still on target for June 2006.	Steve Anderson		
June 29, 2006		- No new status. Standards to develop new drawing	Robert Hull		
August 31, 2006		- Drawing needs to be created.			
November 30, 2006		- Drawing developed and out for comment.			
February 22, 2007		- Still being worked. In coordination process.			

Date Initiated/Updated	Item #	Action	Assignments	Status	Target Date
August 25, 2005	3	- Supplemental Specification 01554, Traffic Control (originally tracked as 00555M, Prosecution and Progress, Limits of Operation): Coordinate the required action to have the process placed in the proper location, to the detail necessary and bring the recommendation to the Standards Committee for approval.	John Leonard	Open	April 2007 meeting
October 27, 2005		- Item not ready. To be reviewed by the Operations Engineer. Target date updated.	Tracy Conti Robert Hull		
February 23, 2006		- Direction being reviewed by upper management.			
April 27, 2006		- Still being review by upper management for direction.			
June 29, 2006		- No change other than item may be on hold.	Robert Hull		
August 31, 2006		- No change.			
November 30, 2006		- Item being reviewed. Changed to track as Section 01554.			
February 22, 2007		- Still being worked			
February 22, 2007	N/A	No new Action Log items from this meeting.			

Closed Items From Last Meeting (February 22, 2007)					
Date Initiated/Updated	Prior Item #	Action	Assignments	Status	Target Date
April 27, 2006	4	Put team together to review the removal of Sheets 1B and 1C and make recommendation.	Richard Miller Barry Axelrod	Closed	February 2007 meeting
June 29, 2006		To be reviewed with Construction and recommendation made.			Closed
August 31, 2006		Removal of Sheets 1B and 1C approved in separate meeting. New hard copy drawing book to be printed and procedures updated			
November 30, 2006		Hard copy to be put together and printed.	Barry Axelrod		
February 22, 2007		Updated Committee with completed actions.			
August 31, 2006	5	Supplemental Specification 02765, Pavement Marking Paint. To be updated to meet Materials and Maintenance requirements.	Tim Biel Degen Lewis Vincent Liu	Closed	February 2007 meeting
November 30, 2006		Still being worked on.			Closed
February 22, 2007		Approved.			
November 30, 2006	6	Supplemental Specification 02843, Crash Cushion update.	Glenn Schulte Mike Donovan	Closed	February 2007 meeting
February 22, 2007		Approved.			Closed

Standards Committee Agenda Items Section

Submittal Sheets, Supplemental Specification Drafts, Standard Drawing Drafts, and other supporting data for the April 26, 2007 Standards Committee meeting follows.

Standards Committee Submittal Sheet

Name of preparer: Karl Verhaeren
Title/Position of preparer: Engineer for Construction
Specification/Drawing/Item Title: 00120 – Instructions to Bidders; 00515 – Award and Execution of Contracts; 00820 – Legal Relations and Responsibility to Public; 01280 - Measurement
Specification/Drawing Number: _____

Enter appropriate priority level:

(See last page for explanation) 3

Sheet not required on editorial or minor changes to standards. Check with Standards Section.

NOTES:

1. All Submittal Sheets must be completed and sent to the Standards and Specifications Section by the Standards Committee suspense date as shown on the Web.
(<http://www.udot.utah.gov/index.php/m=c/tid=303>)
2. The Preparer of the Submittal Sheet or the Standards Committee member (or authorized substitute) responsible for the submittal must be present at the Standards Committee meeting and capable of discussing and answering all questions related to the submittal. The item will be postponed to a later meeting if one of these people is not present.
3. Notify the Standards and Specifications Section immediately of any changes that impact the presentation to include absence of sponsor or delay in presentation.

Complete the following: (Use additional pages as needed.)

- A. Why? Detail the reason for changing the Standard (Specification or Drawing), what has initiated a new Standard, or what has caused a new or changed item of interest.

The proposed changes are a result of a comprehensive review for purposes of updating all of the general provision sections. General provision sections 00555 – Prosecution and Progress, 00570– Definitions, 00725 – Scope of Work, 00727 – Control of Work, and 01282 – Payment were submitted and approved in November 2006.

The current approved AASHTO Guide Specifications, along with in-progress changes to the Guide Specifications, and the general provisions of other DOTs were reviewed in conjunction with the review and revision of these sections.

- B. How is Measurement and Payment handled? Existing (from the measurement and payment document), modified, or new measurement and payment to be included with all Standard Specifications or Supplemental Specifications.

No changes to measurement and payment

C. Stakeholder Notification for AGC and ACEC:

By email provide the AGC and ACEC Standards Committee member a copy of all pertinent information relating to the specification or drawing. Detail all responses below. Indicate if no comments were received.

Note: There is a two-week response time set for this item.

Refer to the Standards Committee Web site, Members page at <http://www.udot.utah.gov/index.php/m=c/tid=659> for the respective e-mail addresses.

AGC Comments: (Use as much space as necessary.)

Sent to Norm Avery (WW Clyde) and Mont Wilson (Granite) on January 22, 2007 for review and comment.

Comments were requested by March 1, 2007.

ACEC Comments: (Use as much space as necessary.)

Sent to ACEC on January 22, 2007 for review and comment.

Comments were requested by March 1, 2007.

D. Stakeholders? From the list provided, document the stakeholders contacted, detailing: the company, name of contact, how contacted (by phone, email, hard copy, or in person), concerns, and comments of the change. Stakeholders:

Note: There is a two-week response time set for this item. Allow Stakeholders two weeks to process and respond to coordination requests. All areas should try to complete review and comment as soon as possible but within two weeks.

In-house (for example, preconstruction, materials, construction, safety, design, maintenance) (Include all applicable in-house areas even if not listed above.)

District Engineers

Sent to District Engineers and Resident Engineers on January 22, 2007 for review and comment.

Comments were requested by March 1, 2007.

Some questions and comments were received from Fred Jenkins, Robert Westover, Jim Beadles, Larry Myers, Margaret Gish, Thom Leholm and others. All comments and questions were addressed in the proposed changes.

Contractors (Any additional contacts beyond "C" above.)

Suppliers

Consultants (as required) (Any additional contacts beyond “C” above.)

FHWA (To be accomplished as part of the two-week process before submitting to the Standards and Specifications Section for inclusion on the Standards Committee agenda.)
(This is in addition to the requirements of UDOT Policy 08A5-1, procedure 08A5-1.3.)

Sent to FHWA January 22, 2007.

Others (as appropriate)

Sent to all members of the Standards Committee on January 22, 2007.

- E. Other impacted areas, systems, or personnel. (Consider all impacts and possible changes to these areas during the preparation process. Coordinate with all appropriate areas for the respective item. List all impacts and action taken.)

1. Minimum Sampling and Testing Guide (MS&T Guide)

No changes to Minimum Sampling and Testing Requirements

2. Business Systems (Electronic Bid System, Project Development Business System, Electronic Program Management, Computer-Aided Drafting and Design, etc.)

No changes to any business systems

3. Implementation Plan (Provide detailed instructions on how the subject item will be implemented to include notification of all interested parties and training requirements.)

Information concerning the revisions to the general provisions will be provided to the Resident Engineers and District Engineers.

- F. Costs? (Estimates are acceptable.)

1. Additional costs to average bid item price.
N/A
2. Operational (For example, maintenance, materials, equipment, labor, administrative, programming).
N/A
3. Life cycle cost.

- G. Benefits? (Provide details that can be used to complete a Cost – Benefit Analysis.) (Estimates are acceptable.) (If no costs, what is the benefit of making this change?)

Clarification/update of contract requirements.

- H. Safety Impacts?

N/A

- I. History? Address issues relating to the current usage of the item and past reviews, approvals, and/or disapprovals.

N/A

Priority Explanation

Enter the appropriate priority in the box on the first page of the document.

- | | |
|------------|---|
| Priority 1 | Upon posting, this impacts all projects in construction and design with a Change Order, Addenda, and immediate change to projects being advertised. |
| Priority 2 | Upon posting, this impacts projects being advertised. |
| Priority 3 | Upon posting, the approved standard takes effect four weeks later for projects being advertised. |

Supplemental Specification
2005 Standard Specification Book

SECTION 00120

INSTRUCTIONS TO BIDDERS
BIDDING REQUIREMENTS
AND CONDITIONS

Delete Section 00120 in its entirety and replace with the following:

PART 1 GENERAL

1.1 RELATED SECTIONS

A. Section 01455: Material Quality Requirements (New one added)

1.2 REFERENCES

A. Sherman Antitrust Act (Missed on current Standard)

B. United States Department of Treasury Circular (Missed on current Standard)

C. Utah Administrative Code (New one added)

1.31 PREQUALIFICATION OF PREQUALIFYING BIDDERS

A. ~~Applies to~~ Meet Department requirements for prequalification before submitting a proposal on all projects where the Department Engineer's advertised Estimate is greater than or equal to \$1,500,000.

1. Submit prequalification information at least 10 calendar days before submitting a proposal on projects requiring prequalification.

BC. Provide experience information on the Contractor's Application for Prequalification and a confidential financial statement attested to by a certified public accountant.

1. Include a complete report of the bidder's financial resources and liabilities, equipment, work history, and personnel. The Department establishes prequalification amount and work classification.

~~2. Allow a minimum of 10 days for Department approval of the Contractor's Application for Prequalification and financial statements to assure acceptance of a valid bid.~~

~~CB.~~ ~~Renew prequalification~~ Prequalify a minimum of at least once a each year.

1. The Department may change ~~the a bidder's~~ prequalification ~~amount during status at any time that period based~~ upon the submission of ~~an application and~~ additional favorable reports or ~~upon~~ evidence of unsatisfactory ~~reports or~~ performance.
2. The prequalification amount limits bidding to individual contracts of a given size or for a particular type of work.

1.42 BIDDING DOCUMENTS

- A. Prequalified bidders must acquire and submit all proposals in the identical name used on their prequalification statement, or in accordance with a filed affidavit of change in firm name or personnel ownership.
- B. ~~Bidders must Obtain reference the UDOT Website to acquire~~ bidding documents and instructions from the UDOT website. Refer to this sSection, article 1.129.

1.53 JOINT VENTURE BIDDING

- A. ~~Prior to Before~~ submitting a joint proposal on a single project, and at least 4-four working days before the bid opening, submit a letter of intent to the Department's Prequalification Board Secretary indicating the ~~precise exact~~ name of the joint venture and the designated administrative partner. The Department will consolidate individual prequalification amounts for the joint venture bid.
 1. Obtain the following under the joint venture designation before bid opening:
 - a. Contractor license
 - b. Bid bond
 - c. Bid vault certificate
 - d. UDOT Contractor identification, password, and electronic signature

1.64 CONTENTS OF BID PROPOSAL CONTENT

- A. ~~Contents~~ The Department's proposal will state or include the following:
 1. Project Location and description of the contemplated construction.
 2. Estimated of various item quantities and materials to be furnished.
 3. Schedule of unit bid-items for unit bid pricing.
 4. The tTime in which thefor completing work must be completed.
 5. Amount of the pProposal guaranteeey amount.
 6. The dDate, time and place of the bid opening of proposals.
 7. Basis for proposal comparison, if it is other than total cost.
 8. Contract requirements not contained in the standard specifications.

7.9. DBE requirements, as required when applicable.

8.10. Date, time, and location for Mandatory Pre-Bid Conference, as required when applicable.

- B. The Department considers all documents forms associated to designated in the Bid Proposal as a required part of the Proposal.

1.587 ACCEPTANCE OF BID PROPOSALS

- A. The Department reserves the right to disqualify a bidder as non-responsive or refuse a Bid Proposal for any ~~or all~~ of the following reasons:
1. Lack of or insufficient amount of prequalification or unauthorized work classification. Proposal does not acknowledge receipt of addenda.
 2. Uncompleted work under contract that the Department determines will hinder or prevent the prompt completion of additional work if awarded. Award of additional work could impede or prevent timely completion of work currently under contract.
 3. Failure to pay or settle all outstanding labor and material bills or claims for a contract current at the time the proposal is issued.
 4. Failure to comply with any qualification regulations. More than one proposal for the same work is submitted from an individual, firm, or corporation under the same or different names.
 5. Default under previous contracts.
 6. Unsatisfactory performance on previous or current ~~C~~ contract(s)
 7. Debarment by the Department, any State, or the Federal Government.
 8. Serious misconduct that adversely affects the ability to perform future work.
 9. Failure to reimburse the Department for monies owed on any previously awarded ~~Department~~ contract, including any contracts where the prospective bidder was a party ~~in to~~ a joint venture that failed to reimburse the Department.
 10. Bid Guarantee received after date and time specified.
 11. Non-attendance ~~to of~~ a mandatory pre-bid meeting.
 12. Proposal received after date and time for the opening of bids bid opening.
 13. ~~DBE non-compliance.~~ Manually submitted delivered diskette is blank or unreadable.
 14. Proposal Not submitted using UDOT's current EBS program.
- B. If the Department refuses to ~~issue~~ accept a Bid Proposal for any of the foregoing reasons, the bidder may appeal in writing to the UDOT Deputy Director pursuant to administrative rules regarding administrative procedures and appeals as set forth in Utah Administrative Code R907-1, as amended.
1. ~~Specify the basis for the appeal in the written request.~~
 2. ~~The Deputy Director may schedule either an informal or formal hearing.~~

1.658 INTERPRETATION OF QUANTITIES IN INTERPRETING BID PROPOSAL QUANTITIES

- A. Submit unit bid prices for the estimated quantities.
1. Proposal quantities are estimates used for comparison and may be increased, decreased, may increase, decrease, or be eliminated in their entirety under the contract.
 2. The Department pays for actual quantities of work performed and accepted, and materials furnished under the contract.

1.69 BUY AMERICA REQUIREMENTS

- A. Refer to Section 01455.

1.710 EXAMINATION OF PLANS, SPECIFICATIONS, SPECIAL PROVISIONS, DOCUMENTS AND WORK SITE

- A. Carefully examine the contract documents and perform a reasonable site investigation before submitting a Bid Proposal.
1. The Bidder is responsible for all site conditions that should have been discovered had a reasonable site investigation been performed.
 2. A reasonable site investigation includes investigating the project site, borrow sites, hauling routes, and all other locations related to the performance of the work.
 23. Submitting a Bid Proposal is considered an affirmative statement that the bidder has examined the contract documents and project site, investigated the nature and location of the work, and is satisfied as to the character, quality, and as conclusive evidence the bidder knows the general and local conditions to be encountered in performing the work that can affect the work or its cost and the requirements of the proposed contract, including, but not limited to:
 - a. Conditions bearing upon transportation, disposal, handling, and storage of materials.
 - b. The availability of labor, water, electric power, and roads.
 - c. Uncertainties of weather, river stages, irrigation channel flow, lake and reservoir levels, or similar physical conditions of the ground.
 - d. The type of equipment and facilities needed preliminary to and during work performance.
 - e. The character, quality, and quantity of surface and subsurface materials or obstacles to be encountered insofar as this information is ascertainable from an inspection of the site, as well as from the drawings and specifications and all exploratory work made available by the Department.

- B. All Department boring logs and other records of subsurface investigations are available for information purposes only and are not substitutes for the bidder's own investigation, interpretation, and judgment. It is understood such information was obtained and used for Department design and estimating purposes only.
- C. The Bidder is permitted to converse with Department personnel knowledgeable of the project, plans, specifications, materials sites, or conditions generally prevailing in the area of the proposed work to aid in pre-bid investigations.
1. ~~Bidder conducts independent investigation, including a visit to the site of work. The Engineer is available by appointment.~~
 2. The Engineer is available by appointment. The Department is bound only by written statements, representations, or descriptions of conditions and work. No oral explanations or instructions are binding.
- ~~D. The Department is bound only by written statements, representations, or descriptions of conditions and work. No oral explanations or instructions are binding.~~
- ED. ~~To r~~Request explanations of the written proposal documents, by contacting the Engineer 14 calendar days ~~prior to~~before bid opening to allow a reply before proposal submission.
1. The Department responds to written requests from to all prospective bidders by certified letter or electronic communications before the specified time for opening proposalsbid opening.
- ~~Consider all utility and local government facilities impacted by the project and recognize the limited ability the Engineer has to control the work of such entities. No compensation is allowed for inconvenience and delay caused by utilities, local governments, and special service districts.~~
- E. Immediately notify the Department of any apparent error, omission or ambiguity in the bid package.
- ~~F. Bidder acknowledges that he/she has investigated the nature and location of the work and knows the general and local conditions that can affect the work or its cost, including but not limited to:~~
1. ~~Conditions bearing upon transportation, disposal, handling, and storage of materials.~~
 2. ~~The availability of labor, water, electric power, and roads.~~
 3. ~~Uncertainties of weather, river stages, irrigation channel flow, lake and reservoir levels, or similar physical conditions of the ground.~~
 4. ~~The type of equipment and facilities needed preliminary to and during work performance.~~

~~G. The character, quality, and quantity of surface and subsurface materials or obstacles to be encountered insofar as this information is ascertainable from an inspection of the site, as well as from the drawings and specifications and all exploratory work made available by the Department.~~

~~HF.~~ Failure to take the actions described and acknowledged in this ~~A~~ article does not relieve the Contractor of the responsibility for estimating the difficulty and cost of successfully performing the work, or from proceeding to successfully perform the work without additional cost to the Department.

1.8911 UDOT ELECTRONIC BID SYSTEM PREPARING THE PROPOSAL

A. Obtain UDOT's ~~newest-current~~ version of the Electronic Bid System (EBS) from the UDOT website. Refer to <http://www.udot.utah.gov/index.php/m=c/tid=719>.

1. Contact the UDOT Construction Division for Contractor ID and EBS training.

B. Prepare and electronically submit ~~bid P~~ proposals using the Department's current ~~Electronic Bid SystemEBS~~ ~~prior to~~ ~~before~~ the specified ~~bid~~ opening date and time ~~for bid~~.

1. Complete all electronic bid documents specified on the Bid Submission Check List and Forms.

2. Confirm receipt of addenda.

C. When the ~~P~~ proposal permits a choice ~~of (alternate items) to be made~~, indicate the choice in the ~~Electronic Bid SystemEBS~~. The program will not permit an additional choice.

D. Save ~~E~~ electronic bid documents until ~~project the contract~~ has been awarded.

~~E. Submit bid Guarantee using the current version of EBS. Apparent low bidder delivers original guarantee if in the form of cashier's or certified check within 3 working days of bid opening.~~

~~F. Confirm receipt of addenda.~~

~~GE.~~ Provide the name and address of the individual signing the ~~P~~ proposal as well as the following names and addresses, as applicable.

Type of Bidder	Names and Office Addresses Required
Individual	Individual and Post Office address
Partnership	Each Member of the Partnership and each Post office address

Joint Venture	Each Member or officer of Firms represented and each post office address
Corporation	Corporation Name and corporate address

~~HF.~~ By signing the Bid Report (electronically or manually), bidders certify they understand and are in compliance with all terms and conditions of the contract standard and special provisions.

1.91012 **IRREGULAR ~~BID~~-PROPOSALS**

A. The Department considers a ~~Bid Pp~~ proposal irregular and rejects the ~~Bid Pp~~ proposal as non-responsive if:

1. Not properly signed.
2. The Contractor is not prequalified or there is an insufficient amount of prequalification or unauthorized work classification. The Proposal is incomplete or in a format other than the newest version of the electronic bid system.
3. Contains aUUnauthorized additions, conditional or alternate bids, or other irregularities ~~that~~ make the ~~Bid Pp~~ proposal incomplete, indefinite, or ambiguous.
4. Includes aAdded provisions reserving-reserve the bidder's right to accept or reject an award, or to enter into a contract pursuant to anfollowing award.
 - a. This does not exclude a ~~bid~~ proposal limiting the maximum gross ~~amount of awards~~ amount acceptable to any one bidder at any one bid letting. The Department selects which contracts to award.
 - b. ~~The Department selects awards.~~
5. It lacks required bid documentation escrow, when applicable.
6. Noncompliant with any prequalification regulations.
7. It fails to furnish a properly executed proposal guaranty in accordance with this section.
8. There is evidence of collusion among bidders.
- 10.9 The Ppproposal does not comply with conditions of current special provision for certification of Affirmative Action (DBE).
11. ~~Manually submitted diskette is bland or unreadable.~~
10. It omitsDoes not contain a unit price for each-any estimated pay item listed and the amount for each lump-sum item, except in the case offor authorized alternate pay-bid items.
11. It is materially unbalanced.
5. ~~Unsigned or not properly signed (electronically or manually).~~
6. ~~A bid guarantee that is not submitted in accordance with this Section, article 1.10, Proposal Guarantees.~~
12. The proposal Ddoes not contain-have a Status of Work Under Contract if required, reflecting the eContractor's current prequalification status or:

- a. Is incomplete and improperly executed.
- b. ~~Indicates that~~ The sum of the amount of all uncompleted work plus the estimate of the amount of work ~~to be bid upon~~ exceeds the amount for which the Contractor is prequalified.

~~8. Any of the unit bid prices are significantly unbalanced to the potential detriment of the Department. The Department may require written justification for the basis of the unit prices before making a decision as to whether the bid is irregular.~~

~~9. The receipt of Addenda is not acknowledged.~~

13. The proposal fails to meet any other material requirement of the invitation for bids.

~~12. Surety Company is not listed in Department of Treasury Circular 570.~~

1. ~~10~~ 11 ~~13~~ PROPOSAL ~~GUARANTEES~~ GUARANTY

A. Provide a proposal guaranty in the form ~~of a certified check or~~ an electronic guaranty bond, or provide evidence of securing a cashier's or certified check, for not less than 5 percent of the total amount of the bid made payable to the Utah Department of Transportation and issued from a surety company listed on the United States Department of Treasury Circular 570 before the specified date and time for bid opening.

- 1. Use UDOT approved surety clearing house for electronic guaranty bond.
- 2. Use current version of the UDOT EBS program.
- 3. Apparent low bidder delivers proposal guaranty in the form of cashier's or certified check within 3-three calendar days of bid opening.

1. ~~11~~ 12 ~~14~~ PROPOSAL ~~ELECTRONIC~~ DELIVERY OF BID PROPOSALS

A. Electronically transmit the ~~Bid P~~proposal ~~prior to before~~ the time specified in the Notice to Contractors.

B. A manually ~~submitted~~ delivered ~~bid proposal~~ takes precedence over an electronically ~~submitted~~ delivered ~~bid proposal~~.

1. ~~12~~ 13 ~~15~~ WITHDRAWAL OR ~~REVISION OF~~ REVISING BID PROPOSALS

A. ~~Prior to the 2:00 p.m. advertised bid opening date, a~~ A bid proposal may be withdrawn or revised before the time set for receiving proposals.

B. Provide the request for withdrawal to the Department ~~in writing to include a company authorized signature and the UDOT Contractor ID, or with~~ a telephone call followed by documented electronic communications ~~to include~~ including a

company authorized signature and the UDOT Contractor ID before the time set for ~~opening-receiving bid~~ proposals.

1.131416 COMBINATION OR CONDITIONAL ~~BID~~ PROPOSALS

- A. ~~Bid~~ Proposals may be issued for projects in combination or separately.
1. ~~Bid~~ Proposals may be submitted either on the combination or on separate units of the combination.
 2. The award of combination ~~bid~~ proposals or separate ~~bid~~ proposals are made to the advantage of the Department.
 3. The Department will ~~not~~ consider only proposal combinations ~~bid proposals other than those specifically set up in the Bid Proposal that it specifies~~.
 4. The Department writes separate contracts for each individual project included in the combination.
- B. The Department considers conditional ~~bid~~ proposals only when specified in the advertisement.

1.141517 PUBLIC OPENING OF ~~BID~~ PROPOSALS

- A. ~~Bid~~ Proposals will be downloaded from the third party repository and publicly opened at the time indicated in the ~~advertisement~~ invitation for bids.

~~1.15~~ DISQUALIFICATION OF BIDDERS

- ~~A. Department disqualifies a bidder and rejects a Bid Proposal for any of the following:~~
- ~~1. More than one Proposal for the same work from an individual, firm, or corporation under the same or different names.~~
 - ~~2. Evidence of collusion among bidders. Collusion participants are not recognized as bidders for future work until they are reinstated as a qualified bidder.~~

1.1618 CERTIFYING NON-COLLUSIVE BIDDING ~~CERTIFICATION~~

- A. ~~By submitting this Bid Proposal, e~~Each bidder and each person signing on behalf of any bidder certifies as to its own organization, under penalty of perjury, that to the best of their knowledge and belief:
1. The prices in ~~this the Bid P~~proposal have been arrived at independently without collusion, consultation, communication, or agreement with any other bidder or ~~with any~~ competitor for the purpose of restricting competition.

2. Unless required by law, the prices that have been quoted in ~~this-the bid~~ proposal have not been and will not be knowingly disclosed by the bidder, directly or indirectly, to any other bidder or competitor before ~~bid~~ opening of Bid Proposals.
 3. No attempt has been made or will be made by the bidder to induce any other person, partnership, or corporation to submit or not to submit a Bid Proposal for the purpose of restricting competition.
 4. ~~The signers of the Bid Proposal will tender to the Department a sworn statement that the~~ The named Contractor(s) has not, whether directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken any action to restrain free competitive bidding in connection with this Proposal.
- B. The Department ~~considers now~~ will not consider a Bid Proposal for award, nor ~~will it makes~~ any award where there has not been compliance with this article, ~~paragraph A,~~ except as follows:
1. If the bidder cannot make the foregoing certification, the bidder must furnish with the ~~bid~~ proposal a signed statement that describes in detail the reasons why the certification cannot be made.
 2. The Executive Director, or designee, determines that such disclosure was not made for the purpose of restricting competition.
- C. Any of the following does not constitute a disclosure within the meaning of this article, paragraph A, line 1:
1. A bidder has published price lists, rates, or tariffs covering items being procured.
 2. A bidder has informed prospective customers of proposed or pending publication of new or revised price lists for such items.
 3. A bidder has sold the same items to other customers at the same prices being bid.
- D. A Bid Proposal made by a corporation is considered authorized by the board of directors of the bidder. Authorization is defined as signing and submitting the ~~bid~~ proposal, and includes the declaration of non-collusion on the part of the corporation.
- E. UTAH DEPARTMENT OF TRANSPORTATION NON-COLLUSIVE BIDDING CERTIFICATION

“I declare under penalty of perjury under the laws of the United States and the State of Utah that neither I, nor to the best of my knowledge any member or members of my firm or company have either directly or indirectly restrained free and competitive bidding on this project by entering into any agreement, participating in any collusion, or otherwise taking any action unauthorized by the Utah Department of Transportation, with regard to this Contract.”

- F. Signing the Bid Proposal (manually or electronically) certifies compliance with all provisions of this Non-Collusive Bidding Certification.

1.1719 DEBARMENT

- A. The Department may debar a Contractor from performing any work on Department or Department administered projects if:
1. The Contractor or an affiliate (defined as an owner, director, manager, officer or fiscal agent of the Contractor) has been convicted of or entered a plea of guilty or *nolo contendere* to a bid-related or a contract-related crime in any Court of competent jurisdiction.
 2. The Contractor or an affiliate has made a public admission of any bid-related or contract-related crime.
 3. The Contractor or an affiliate has falsified information or submitted deceptive or fraudulent statements in connection with prequalification, bidding, or performance of a contract.
 4. The Contractor or an affiliate has violated relevant antitrust laws covering bid rigging, collusion or restraint of free competition among contractors; (Violations covered by the Sherman Antitrust Act, 15 U.S.C. 1, *et seq.* and Title 76, Chapter 10, Section 911, *et se.*, U.C.A. 1953, as amended).
 5. The Contractor or an affiliate has demonstrated willful wrongdoing reflecting a lack of integrity in bidding or performing public projects.
 6. The Contractor, joint venturer, stockholder of 5 percent or more of the Contract, an affiliate, or any immediate relatives of the aforementioned, has been debarred or affiliated with another debarred person or contractors by the Federal Government or by another State government.
 7. The UDOT Deputy Director has reasonable grounds to believe and finds that the Contractor has acted in collusion with others to perform work on a project that supposedly satisfies disadvantaged business enterprise goals or requirements through other than *bona fide* disadvantaged business entities in any combination of individuals, firms or corporations.
 8. The Contractor or affiliate has defaulted under previous contracts.
 9. The Contractor or affiliate has unsatisfactory performance on previous work or current Contract(s) consisting of, but not limited to:
 - a. Noncompliance with Contract.
 - b. Failure to complete work on time.
 - c. Instances of substantial corrective work before acceptance.
 - d. Instances of completed work that requires acceptance at reduced pay.
 - e. Production of non-specification work or materials, and when applicable, required price reductions or corrective work.
 - f. Failure to provide adequate safety measures and appropriate traffic control that endangered the safety of the work force and public.

10. The Contractor or an affiliate has questionable moral integrity as determined by the Department, the Attorney General of Utah or the Attorney General of the United States.
11. Failure to reimburse the State for monies owed on any previously awarded contract including those where the prospective bidder is a party to a joint venture and the joint venture has failed to reimburse the State for monies owed.
12. The UDOT Deputy Director has reasonable grounds to believe and finds that the public health, welfare or safety imperatively requires such action.

1.1820 STATUS PENDING DEBARMENT

- A. The Contractor notified of proposed debarment as provided above is not permitted to contract with the Department, nor act as a subcontractor unless a request for either an information or formal hearing is pending.
 1. However, if the Department's Deputy Director believes there is probable cause that a Contractor has engaged in activity that would, if true, lead to debarment under Utah Admin. Code R907-67-1, the Deputy Director may suspend the Contractor from consideration for award of contracts.
 - a. A contractor who is suspended may not submit a bid on any Department proposals, nor act as a subcontractor for the duration of suspension.
 - b. The duration of the suspension is for the greater of:
 - 1) Three months
 - 2) The duration of the Contractor's appeal
- B. The proposed debarment period does not ~~commence~~begin until the Department decision has been issued following the said hearing or hearings.

1.1921 LENGTH OF DEBARMENT

- A. Debarment is for a term of not less than six months and up to three years as determined by the Deputy Director.
- B. The Department may adjust the period of debarment for mitigating circumstances including but not limited to the following:
 1. Degree of culpability.
 2. Restitution of damages to the State.
 3. Cooperation in the investigation of other bidding crimes.
 4. Disassociation with those involved in bidding crimes.
 5. Protection of the State that may be required.
 6. If such action would have unintended adverse consequences on competition.

- C. Debarment in no way affects the obligation of a Contractor to the Department to perform under existing contracts.
- D. The Department also reserves the right to declare a debarred Contractor in default on any existing contracts for adequate cause as provided in such contracts.

1.2022 DEBARMENT PROCEDURES

- A. The procedure described in this Section, article Debarment applies if it is found that a ~~e~~Contractor or an affiliate thereof is violating the prohibited activities.
- B. The ~~Engineer for Construction~~Director for Construction and Materials notifies the Contractor in writing and by certified mail of the Department's intention to debar. Written notice specifies:
 - 1. The grounds for such intended debarment.
 - 2. The date debarment becomes effective and the intended period of debarment.
 - 3. The procedure to follow if the Contractor desires to challenge the debarment or to offer information to the Department in mitigation of its alleged actions.
- C. Within 15 calendar days of receiving the notice of intended debarment, the Contractor may request either:
 - 1. An ~~informal~~investigative hearing before the ~~Engineer for Construction~~Director for Construction and Materials.
 - 2. An informal administrative hearing before the UDOT Deputy Director.
- D. The Contractor who elects to proceed at an ~~informal~~investigative hearing has the opportunity to appear at a mutually agreed upon time and location.
 - 1. The Contractor may supply information in support of their position and has the opportunity to review the Department's evidence, present evidence, and discuss matters informally.
 - 2. No legal counsel is permitted for either party at the informal hearing.
- E. The UDOT Deputy Director of Transportation or designee conducts ~~a the~~ informal administrative hearing with assistance from ~~the Department's legal counsel~~Department staff as required. The Contractor who appears may be represented by counsel and has the opportunity to review the Department's evidence, and to present evidence in rebuttal either by sworn affidavit or by sworn testimony.
- F. Following either ~~a formal or informal~~ hearing, the Department representative conducting the hearing issues a written decision no later than 30 calendar days following the hearing.

~~G. The decision of the UDOT Deputy Director following a formal hearing is administratively final and specifies the facts justifying the Department's actions and conclusion.~~

HG. If the ~~Engineer for Construction~~Director for Construction and Material's decision is to be appealed, the Contractor files notice in writing with the UDOT Deputy Director within 20 calendar days after receiving the decision from the ~~Engineer for Construction~~Director for Construction and Materials. The Deputy Director then schedules a formal hearing as specified above.

H. The decision of the UDOT Deputy Director following an informal hearing is administratively final and specifies the facts justifying the Department's actions and conclusion.

PART 2 PRODUCTS Not used

PART 3 EXECUTION Not used

END OF SECTION

Supplemental Specification
2005 Standard Specification Book

SECTION 00515

CONTRACT AWARD AND EXECUTION ~~OF CONTRACTS~~

Delete Section 00515 in its entirety and replace with the following:

PART 1 GENERAL

1.1 RELATED SECTIONS

- A. Section 00570: Definitions

1.2 REFERENCES

- A. United States Department of Treasury Circular (Missed on current Standard)

1.23 CONSIDERATION OF ~~BID~~ PROPOSALS

- A. The Department publicly opens properly executed ~~Bid-P~~proposals using the current version of the EBS to compare bids on the basis of the summation of the products of the quantities and the unit bid prices.
1. The Department makes the results of the comparisons available to the public.
 2. The unit bid prices govern if a discrepancy exists between unit bid prices and extensions.
- B. The Department reserves the right to reject any or all ~~Bid-P~~proposals, waive technicalities, or advertise for new ~~Bid-P~~proposals ~~or proceed to do the work~~.
- C. The bidder can request withdrawal of a bid after bid opening by:
1. Submitting to the ~~Engineer for Construction~~Director for Construction and Materials a notarized affidavit within 24 hours after bid opening declaring a clerical or mathematical error in bid preparation.
 2. Submitting accompanying declaration with original work sheets used in bid preparation.
 3. Describing specific error(s) in detail.
 4. Verifying that error has a significant monetary effect in the amount of 3 percent of the bid or greater.

Contract Award and Execution ~~of Contracts~~

00515 – Page 1 of 5

January 1, 2005April 26, 2007

- D. ~~Judgmental errors are not grounds for requesting bid withdrawal~~The bidder may not request bid withdrawal for judgmental errors.

1.34 ~~AWARDING OF THE~~ AWARDING OF THE CONTRACT

- A. The Department awards the €contract to the lowest responsible bidder within 30 calendar days.
- B. The Department may withhold award beyond the 30 calendar days with the approval of the successful bidder.
- C. If the award is not made within 30 calendar days, the bidder may withdraw the Bid-Pproposal without liability.
- D. The Department notifies the successful bidder by letter mailed to the address shown on the Bid-Pproposal that the bid has been accepted and the €contract has been awarded.

1.45 ~~CANCELLATION OF~~ CANCELING THE AWARD

- A. The Department reserves the right to cancel the award of any €contract before execution without liability.

1.56 ~~RETURNING OF~~ RETURNING OF PROPOSAL GUARANTY

- A. Proposal guaranties are returned after satisfactory contract bonds and all insurances have been furnished and the €contract has been executed.
- B. A bidder is not released from the bidding obligation because of an alleged error in the preparation of the Bid-Pproposal unless the Department returns the proposal guaranty.

1.67 CONTRACT BONDS

- A. The Department furnishes required contract bond forms.
- B. Return executed forms to the Department as required by the Utah Procurement Code.
 - 1. **Payment Bond** secures the payment of the claims of laborers, mechanics or materialmen employed on the work under the €contract.
 - 2. **Performance Bond** guarantees the faithful performance of the €contract.

- C. Each bond must equal 100 percent of the contract price.
- D. Underwriting Limitation is stated in the United States Department of Treasury Circular 570; Surety Companies Acceptable on Federal Bonds. Only companies listed in the Department of Treasury Circular 570 are acceptable.
- E. The Department may make alterations, extensions of time, extra and additional work, and other changes authorized by the Ccontract without securing the consent of the surety or sureties on the contract bonds.
- F. If a Contractor's surety is unable to provide payment, the Department cancels all work on the Ccontract, unless the Department determines it is in the public interest to continue the work.
- G. As an alternate contract bond, furnish a cash bond of two cashier's checks, each in the amount of Contractor's bid amount.
 - 1. The Department holds the cash bond and uses it when needed for correction of any non-performance or non-payment.
 - 2. Upon release by the Engineer for satisfactory completion of the work, the Department returns to the Contractor one half of the cash bond minus any cost against the bond.
 - 3. If no payment claims have arisen within 90 calendar days after release by the Engineer, the Department releases the remaining cash bond.
 - 4. The Department holds the cash bond until the non-performance and non-payment issues are resolved. Contractor accrues no liability during this time.
 - 5. The Department decides the need for withholding the cash bond.

1.78 ~~EXECUTION AND APPROVAL OF~~ EXECUTING AND APPROVING THE CONTRACT

- A. Return the signed Ccontract, properly executed contract bonds, and all required insurances to the Department within 15 calendar days after notice of award.
 - 1. The bidder can withdraw the bid proposal without penalty if the Department does not execute the Ccontract within 30 calendar days after receiving signed Ccontracts and Bbonds and insurances.
 - 2. The Ccontract is not considered in effect until executed by all parties.

1.89 MATERIALS GUARANTY

- A. The successful bidder must:
 - 1. Furnish a complete statement of the origin, composition, and manufacturer of material proposed for use in the construction.
 - 2. Furnish samples to be tested and inspected for meeting the Ccontract.

- B. Contractor may be required to furnish a written guaranty covering certain items of work for varying periods of time from the date of acceptance of the ~~C~~contract.
1. The Department specifies in the ~~C~~contract the work to be guaranteed, the form, and the time limit of the guaranty.
 2. Sign and deliver the guaranty to the Engineer before acceptance of the ~~C~~contract in accordance with Section 00570.
 3. Upon completion of the ~~C~~contract, the required ~~P~~performance ~~B~~bond may be reduced to conform to the total amount of the contract bid prices for the items of work to be guaranteed. This amount continues in full force and effect for the duration of the guaranty period. Refer to this Section, article 1.~~67~~, Contract Bonds.

1.910 FAILURE TO EXECUTE CONTRACT

- A. The Department can cancel the notice of award and keep the proposal guaranty if the successful bidder ~~fails to~~does not execute the ~~C~~contract and file acceptable ~~B~~bonds and insurance certificates evidencing coverage within 15 calendar days after the date of the Notice of Award.
- B. The Department may then award the ~~C~~contract to the next lowest responsible bidder, or may re-advertise the work.

1.11 ESCROW OF BID DOCUMENTATION

- A. If specified, submit with the proposal a legible copy of the bid documentation, as defined in Section 00570. Meet the following:
1. Submitting and Returning Bid Documentation
 - a. Submit bid documentation in a sealed container clearly marked “Bid Document” and labeled with the bidder’s name and address, submission date, and project number.
 - b. Bid documentation is returned to all but the successful bidder after the contract has been executed.
 2. Affidavit
 - a. In addition to bid documentation, submit a signed and certified affidavit that lists each bid document submitted by author, date, nature and subject. The affidavit must attest that:
 - 1) The affiant has examined the bid documentation and that the affidavit lists all documents used to prepare the bid.
 - 2) The sealed container contains all such bid documentation
 3. Duration and Use
 - a. After executing the contract, the Department and the Contractor must jointly deliver the sealed container and affidavit to a bank or other Department-designated bonded document depository for

- safekeeping in a safety deposit box, vault, or other secure accommodation.
- b. The document storage agreement must indicate that the bid documentation and affidavit will remain in escrow during the life of the contract or until the Contractor notifies the Department of its intent to file a claim or initiate contract-related litigation against the Department. Such action is sufficient ground for the Department to obtain the release and custody of the escrowed bid documentation.
 - c. Absent a claim or notice of the Contractor's intent to file a claim, the Department will direct the depository to release the sealed container to the Contractor provided the Contractor signs the final standard release form.
 - d. Certifying that the materials in escrow represent all documentation used to prepare the bid waives the Contractor's rights to use bid documentation other than those in escrow, should contract disputes arise.
4. Refusal or Failure to Provide Bid Documentation
- a. Failure to provide bid documentation renders the bid nonresponsive.
5. Confidentiality
- a. Materials held in escrow remain the property of the Contractor unless the Department receives the Contractor's notification of intent to file a claim or litigation ensues. If either occurs, the materials become the property of the Department until the claim is resolved or litigation is concluded.
 - b. Originals and copies of escrow materials will be returned to the Contractor once litigation is concluded, outstanding claims are resolved, or final release is executed.
 - c. The Department will make every reasonable effort to ensure the confidentiality of bid documentation to the extent allowed by the Governmental Records Access and Management Act, Title 63, Title 2, Utah Code Annotated.
6. Cost and Escrow Instruction
- a. The Department will pay to store all escrowed materials and will provide escrow instructions to the depository.
7. Payment
- a. Include within the overall contract bid price all costs to comply with this article.

PART 2 PRODUCTS Not used

PART 3 EXECUTION Not used

END OF SECTION

**Supplemental Specification
2005 Standard Specification Book**

SECTION 00820

LEGAL RELATIONS AND RESPONSIBILITY TO THE PUBLIC

Delete Section 00820 in its entirety and replace with the following:

PART 1 GENERAL

1.1 RELATED SECTIONS

- A. Section 00570: Definitions
- B. Section 01355: Environmental Protection
- C. Section 01554 : Traffic Control

1.2 REFERENCES

- A. Manual of Uniform Traffic Control Devices (MUTCD)
- B. OSHA Safety and Health Regulations for Construction
- ~~BC.~~ UDOT Construction Safety and Health Manual
- ~~CD.~~ UDOT Owner Controlled Insurance Program (OCIP)
- ~~DE.~~ ~~U. S. Code of Federal Regulations~~ Title 29 CFR U.S. Code of Federal Regulations
- E. Title 30 CFR

1.3 ~~GENERAL LEGAL COMPLIANCE~~ OBSERVING LAWS, RULES, AND REGULATIONS

- A. Observe and comply with all of the following that affect the conduct of work on the project, have jurisdiction or authority over the work, or that affect individuals engaged or employed on the project:
 - 1. Federal and State Laws
 - 2. Local laws, ~~and~~ ordinances, and health officials

3. Regulations, orders and decrees of bodies or tribunals having any jurisdiction or authority
 4. UDOT Construction Safety and Health Manual
- B. Protect and indemnify the Department and its representatives against claim or liability arising out of or resulting from violations of ~~from the violation of~~ any of the above listed items, whether violated by employees, agents, or contractors of the following ~~companies or their employees~~:
1. The Contractor
 2. Subcontractor(s) at any tier
 3. Suppliers of materials or services
 4. Any others engaged by the Contractor
- ~~C. Immediately notify the Engineer in writing upon discovering any discrepancy or inconsistency between the Contract and any law, ordinance, regulation, or order, except as noted in article 1.10.~~

~~1.4~~ SANITARY, HEALTH, AND SAFETY

- ~~A. Observe the rules and regulations of Federal, State, UDOT Construction Safety and Health Manual, and local health officials.~~
- BC. Do not require employees of the Contractor or subcontractor(s) to work in surroundings, or under conditions that are unsanitary, hazardous, or dangerous to health or safety.
1. Immediately correct any conditions that do not comply with the foregoing provisions.
 - a. The Engineer issues a stop work order when either site conditions and/or work practices present an imminent danger (i.e. may result in serious injury, death, or extensive property damage) until those conditions and/or practices are corrected.
 - b. A stop work order does not provide relief from completing the project within the specified contract completion time.
- ED. Allow access to all areas of work on the project and admit any inspector of the OSHA or other legally responsible agency involved in safety and health administration without delay and without presentation of an inspection warrant to all areas of the work and project site upon presentation of proper credentials.
- ~~D. Immediately correct any conditions that do not comply with the foregoing provisions.~~
1. ~~The Engineer issues a stop work order when either site conditions and/or work practices present an imminent danger (i.e. may result in serious injury, death, or extensive property damage) until those conditions and/or practices are corrected.~~

- ~~a. — A stop work order does not provide relief from completing the project within the specified contract completion time.~~
- E. Comply with Federal, State and local laws, rules, and regulations that enumerate unlawful employment practices including discrimination because of race, religion, color, sex, age, disability, or national origin, and that define actions required for Affirmative Action and Minority/Disadvantaged Business programs.
- F. Immediately notify the Engineer in writing upon discovering any discrepancy or inconsistency between the contract and any law, ordinance, regulation, or order, except as noted in ~~the Section~~, article 1.6.

1.51.84 USING EXPLOSIVES

- A. Comply with all laws and ordinances ~~and as well as specifically Code of Federal Regulations~~ Title 29 CFR, Part 1926 - Safety and Health Regulations for Construction (OSHA), ~~and~~ Title 30 CFR, and the UDOT Construction Safety and Health Manual, whichever is the most restrictive, in the use, handling, loading, transportation, and storage of explosives and blasting agents.
- B. Do not endanger life, property, or work with the use of explosives.
- C. Accept liability for property damage, injury, or death resulting from the use of explosives.
- D. Notify property owners and public utility companies in the vicinity of the proposed detonation before using any explosives.

1.6 CIVIL RIGHTS

- ~~A. — Comply with Federal, State and local laws, rules, and regulations that enumerate unlawful employment practices including discrimination because of race, religion, color, sex, age, disability, or national origin, and that define actions required for Affirmative Action and Minority/Disadvantaged Business programs.~~

1.71.105 PROTECTING FORESTS

- A. Perform work within or adjacent to State or National Forest under regulations of the State Fire Marshal, Conservation Commission, Forestry Department, or other authority having jurisdiction governing the protection of forests.
- B. Keep the project site orderly and clean.
- C. Obtain all required permits.

- D. Prevent and assist with the suppression of forest fires.
- E. Cooperate with responsible forestry officials.

1.81.46 PERMITS, LICENSES, AND TAXES

- A. Acquire all permits and licenses; pay applicable charges, fees, and taxes; and give all notices necessary to perform the work.
- B. Include these costs in the appropriate unit prices bid for the Econtract items.

1.91.57 PATENTED DEVICES, MATERIALS, AND PROCESSES

- A. Provide proof of legal agreement with the patentee or owner, if necessary, for use of any of the following: a design, device, material, or process covered by letters, patents, or copyrights
 - 1. Design(s)
 - 2. Devised(s)
 - 3. Material(s)
 - 4. Process(es)
 - 5. Trademark(s)
 - 6. Copyright(s)
- B. Indemnify and hold harmless the Department and any affected third party or political subdivision from claims of infringement of patents, copyrights, or trademarks that result from use of any patented or copyright item listed above.
- C. Indemnify the Department for costs, expenses, and damages, which it may be obligated to pay as a result of an ~~for payment resulting from~~ infringement during the conduct of the work or after the project is completed.

1.101.68 FEDERAL AID PARTICIPATION

- A. Federal requirements of a federally assisted Econtract supersede conflicting provisions of laws, rules, or regulations.
- B. The Department supervises all work but appropriate Federal officials inspect and approve the work when there is Federal participation in the Econtract. The U.S. Government, however, is not a party to the Econtract and will not interfere with the rights of Econtract parties.

1.11.79 PUBLIC CONVENIENCE AND SAFETY ~~—TRAFFIC AND PEDESTRIANS~~

- A. Perform work with minimal obstruction to traffic.
- B. Follow the safety provisions of all applicable laws, rules, codes, and regulations to ensure the safety and convenience of the public and property.
- C. Provide, erect, and maintain all traffic control devices such as barriers, barricades, and warning signs in accordance with MUTCD and Section 01554 requirements to protect the work and the public safety.
 - 1. Use barriers and barricades to delineate highway sections closed to traffic.
 - 2. Illuminate obstructions during darkness and provide warning signs to control and direct traffic.
- D. Erect warning signs before-for work that may interfere with traffic or where new work crosses or coincides with an existing road.
 - 1. Place and maintain warning signs according to the project traffic control plan.
 - 2. Obtain approval before dismantling or removing traffic control devices.
- E. For Pedestrians:
 - 1. Place and maintain warning signs under project traffic control plan.
 - 2. Provide pedestrian access in areas where construction interferes with existing pedestrian access.

1.121.910 ~~PROTECTION AND RESTORATION – PROPERTY AND LANDSCAPE~~ PROTECTING AND RESTORING PROPERTY AND LANDSCAPE

- A. Preserve public and private property during the work.
- B. The Engineer verifies reference to the location of monuments and property line markers before they are moved, disturbed, or damaged.
 - 1. Obtain written approval from the Engineer before moving or disturbing any monuments or markers.
- C. Accept liability for any damage to public or private property resulting from defective work, materials, or non-execution of the Ccontract.
 - 1. Maintain liability until the project is accepted.
- ~~D.~~ ED. ~~Maintain liability until the project is accepted.~~ Restore damaged property to a condition similar or equal to that existing before the damage at no additional cost to the ~~Contract~~Department.
- ~~FE.~~ Temporarily discontinue work if remains of prehistoric dwelling sites or artifacts of historical or archeological significance are encountered. Refer to Section 01355.

1.1211 THIRD-PARTY BENEFICIARY CLAUSE

- A. This contract does not authorize anyone who is not a party to this contract the right to maintain an action for damages under its provisions or to any of the rights of a third-party beneficiary. However, this contract does not prohibit the parties from agreeing to provide third-party beneficiary rights to another party so long as those rights are set forth in a separate agreement and signed by all the parties to this contract and the intended third-party beneficiary.

1.1312 PERSONAL LIABILITY OF DEPARTMENT EMPLOYEES

- A. The Department's authorized representatives act solely as agents and representatives of the Department when carrying out the provisions of or exercising the power or authority granted to them under the Contract.
- B. They are not liable either personally or as employees of the Department for actions in their ordinary course of employment.

1.1413 NO WAIVER OF LEGAL RIGHTS UPON COMPLETION

- A. Upon completion of the Contract, the Department makes final inspection and notifies the Contractor of acceptance.
1. Final acceptance does not prevent the Department from correcting any measurement, estimate, or certificate made before or after completion of the work.
 2. The Department is not prevented from recovering from the Contractor or Surety or both, overpayment sustained for failure of the Contractor to fulfill the obligations under the Contract.
 3. A waiver from the Department for any breach of any part of the Contract is not held as a waiver of any other or subsequent breach.
- B. Even after completion, A assume liability to the Department for latent defects, fraud, or such gross mistakes as may amount to fraud, or as regards to the Department's rights under any warranty or guaranty without prejudice to the terms of the Contract.

1.151.1114 RESPONSIBILITY FOR DAMAGE CLAIMS

- A. To the extent allowed by law, protect, indemnify, and hold the State of Utah, the Department, and their officers, agents, and employees (State) harmless from and against all claims, demands, damages, and causes of action of every kind or character on account of bodily injuries, death, or damage to property arising out of, resulting from, or in any way connected with, the performance of the Contract.

- B. Defend the Department against all third party or other lawsuits arising out of or resulting from the ~~C~~contract Work. The Department may require that the Contractor represent its interests or may choose to have separate counsel. If the Department has its own counsel, the Department pays for its own attorneys' fees, costs, and expenses. Upon determination by the court of the proportionate liability for the claim, total defense costs will be apportioned accordingly. For example, if the court finds the Department to be 60 percent liable for the claim and the Contractor 40 percent liable, then the Department pays 60 percent of the total defense costs while the Contractor pays 40 percent.
- C. If served with a lawsuit or Notice of Claim, Contractor and the Department agree to provide each other with a copy of the summons and complaint within two business days of receipt. Do not file a responsive pleading on behalf of the Department until receiving written notice that the Department chooses to have Contractor handle the defense. The Department will provide the Contractor such written notice in a timely manner allowing the Contractor adequate time to respond to the summons.
- D. If the parties have separate counsel, they agree to cooperate to the fullest extent possible, subject to privileges and ethical rules.
- E. Provide insurance as defined in this Section article 1.~~1615~~ ~~below~~ from reliable insurance companies authorized to do business in Utah, rated "A" or better and with a financial size category of Class VII or larger by A.M. Best Company, at the time of contract execution.
- F. Comply with the following insurance claims notification and processing procedures:
1. Notify the Engineer of all claims within seven days of notification.
 2. ~~Prior to~~Before the final acceptance of the project provide written notification for all pending claims to the Engineer.
 3. Notify claimants of denied or partially denied claims of \$5,000.~~00~~ or less of their right to request re-examination by the
UDOT Claims Re-Examination Board
4501 South 2700 West
West Valley City, UT 84114-8430
Phone: (801) 964-4556
 - a. The information provided to the claimant includes:
 - 1) A time deadline for requesting re-examination equal to seven days after notification of denial or partial denial
 - 2) Address and name of the person to whom it should be directed
 - 3) General information helpful in making a determination
 4. The Board can waive the time deadline.

- G. Cooperate with the UDOT Claims Re-examination Board in resolving disputes regarding denials or partial denials from an insurance carrier.
1. Provide any information possessed by the carrier that the Board believes is pertinent to the determination.
 2. The Board may refer to an insurance carrier's decision and the reason for it.
 3. The determination is based on general applicable standards of insurance adjusting.
 4. The Board does not grant in-person hearings, but relies on documentation prepared by the Contractor, the insurance carrier, the claimant, and the Department.
 5. Neither the insurance carrier nor the Contractor has the right to intervene in a re-examination before the Board.
 6. The board decides the claim as expeditiously as possible.
 7. The decision by the UDOT Claims Re-examinations Board is administratively final.
- H. The Department deducts from the Contractor's pay estimate claims that the Contractor's liability insurance carrier denied but are directed to be paid by the UDOT Claims Re-Examination Board.

1.161.15 INSURANCE REQUIREMENTS:

For projects where the Engineers Estimate is equal to or greater than \$4,000,000 and the ability to select an alternate is provided for in the [electronic bidEBS](#) file, the Contractor may bid one of two insurance alternates ~~allowed in these bid documents~~. Alternate #2 is not applicable on projects where the Engineers Estimate is less than \$4,000,000.

Alternate #1:

Provide insurance per the requirements listed in this section. Include cost for such insurance in the [eContractor's](#) bid prices. When provided for in the [electronic bidEBS](#) file, selection of this alternate is indicated by entering \$1.00 in the unit price field for the Contractor supplied insurance bid item.

- A. Workers' Compensation Insurance
1. Provide Workers' Compensation Insurance to cover full liability. As a minimum, comply with the statutory limits defined by the State of Utah.
- B. General Liability Insurance
1. Provide General Liability insurance with the following minimum limits of liability:
 - a. \$1,000,000 Bodily Injury and Property Damage – Each Accident
 - b. \$2,000,000 General Aggregate
 - c. \$2,000,000 Products and Complete Operations Annual Aggregate

~~C. Excess General Liability Insurance~~

~~1. Provide Excess Liability Insurance with the following minimum limits:~~

~~a. \$5,000,000 Each Claim~~

~~b. \$5,000,000 Aggregate~~

D. Automobile Liability Insurance

1. Provide Automobile Liability Insurance for claims arising from the ownership, maintenance, or use of motor vehicles involved in project work with the following minimum limits:

a. \$1,000,000 Combined single Limit Bodily Injury and Property Damage per Occurrence

E. Provide the following for all required liability insurance policies:

1. Where and when applicable, name as insured, only in respect to work to be performed under this ~~C~~contract, the State of Utah and all institutions, agencies, departments, authorities, and instrumentalities, and while acting within the scope of their duties, all volunteers as well as members of governing bodies, boards, commissions, and advisory committees.
2. Coverage for the above insured is primary and not contributing.
3. Incorporate into the insurance policy this statement: "Insurance coverage is extended to include claims reported up to one year beyond the date of substantial completion of this ~~C~~contract."

F. Provide the Department with certificates of insurance showing that they are covered as required above ~~prior to~~~~before~~ entering the project site or beginning project work. The certificates will also state that the policies required are endorsed to give the Department (the Engineer) not less than 30 days prior notice in the event of cancellation or change in coverage. Within five days of receiving written notice that the Contractor intends to cancel its insurance or change coverage to the extent that it does not comply with the contract requirements, the Department may object. If Contractor cancels coverage or changes coverage despite that objection, the Department may cancel this ~~C~~contract immediately or sue for an injunction or any other legal remedy to require Contractor to keep its current coverage.

G. Regardless of the Contractor insurance requirements required in this section, insolvency, bankruptcy, or failure of any insurance company to pay all claims accrued does not relieve Contractor of any obligations.

H. Endorse all policies to include waivers of subrogation in favor of the Department.

- I. If the Department discovers that the Contractor's policies are not endorsed to the Department, the Engineer gives the Contractor written notice that the certificates need to be modified so as to give the Department the required endorsements.
 1. Complete within 10 calendar days.
 2. Provide new certificates to the Engineer at that time.
 3. If certificates are not obtained, the Department may terminate the Contractor for Default as defined in Section 00555.

Alternate #2

The Contractor may elect to participate in the UDOT Owner Controlled Insurance Program (OCIP). If the Contractor selects the OCIP Alternate, insurance will be furnished at no cost to the Contractor. However, for bid comparison purposes, eContractors that select the OCIP Alternate must calculate 3 percent of the total bid price and enter that amount into their bid by inserting the 3 percent amount into the unit price field for the OCIP Alternate insurance bid item. Failure to do so will result in the bid being declared non-responsive.

- A. OCIP Alternate: Refer to UDOT Owner Controlled Insurance Program (OCIP) General Conditions for coverage limits and conditions on the UDOT website. Refer to <http://www.udot.utah.gov/index.php/m=c/tid=719>.

1.171.16 SITE OF WORK

- A. Refer to definition in Section 00570.

1.181.17 HAULING BY TRUCK ~~—GENERAL~~

AB. When additional trucks are needed for hauling on site only, on a Federal or State funded project, a subcontract must be in the project office before the additional trucks begin work on the project site. Hauling to the project site or away from the project site does not require a subcontract to be approved by the UDOT eEngineer.

BC. When using additional trucks to fulfill the DBE goal, for that project a subcontract approved by the UDOT engineer is always required.

1.19 ~~HAULING BY TRUCK — COMPLIANCE WITH STATE REGULATIONS~~

A. ~~Comply with all State regulations regarding hauling by truck.~~

BA. Comply with all Federal and State regulations regarding hauling. for Federal funded projects, including wages and hours.

1.201.18 AIR QUALITY PROTECTION

- A. Refer to Section 01355.
- B. Contact the Utah Division of Air Quality (DAQ) and obtain the appropriate Air Quality Permit for the project. Permit application forms can be obtained from DAQ's web site. Refer to <http://www.udot.utah.gov/index.php/m=c/tid=719>.
Utah Division of Air Quality
150 North 1950 West
PO Box 144820
Salt Lake City, UT 84114-4810
Phone: (801) 536-4000
Fax: (801) 536-4099
- C. The Contractor is not allowed to proceed with work affecting air quality without an Air Quality Approval Order or Notice of Intent to Approve letter or a Temporary Approval Order for the project, process, or equipment to be used.

PART 2 PRODUCTS Not used

PART 3 EXECUTION Not used

END OF SECTION

**Supplemental Specification
2005 Standard Specification Book**

SECTION 01280

MEASUREMENT

Delete Section 01280 in its entirety and replace with the following:

PART 1 GENERAL

~~1.1~~ ~~REFERENCES~~

- ~~_____ A. ASTM D 633: Standard Volume Correction Table For Road Tar~~
- ~~_____ B. ASTM D 1250: Standard Guide for Petroleum Measurement Tables~~

~~1.2~~ ~~DEFINITIONS~~

- ~~A. Station: 100 ft.~~
- ~~B. Ton: 2,000 pounds avoirdupois.~~

~~1.3~~1.1 ~~GENERAL~~ MEASUREMENT OF QUANTITIES

- A. All work completed under the ~~C~~contract is measured in U. S. ~~S~~standard measure.
 - 1. The Department measures and determines quantities of material furnished and work performed in accordance with the measurement and payment section of the contract.
 - 2. The methods of measurement and computations for determining quantities of material furnished and of work performed under the contract are methods generally recognized as conforming to good engineering practice.
- ~~B. The methods of measurement and computations for determining quantities of material furnished and of work performed under the Contract are methods generally recognized as conforming to good engineering practice.~~
- ~~C. The Department measures and determines quantities of material furnished and work performed.~~
- ~~D~~B. When ~~the plan quantities for a specific portion of the work are designated to be the pay quantities for the Contract~~the term “plan quantity” is indicated in the contract bid item designation:

1. Accept the estimated quantity in the bid proposal as ~~They are~~ the final quantities-quantity for which payment ~~for such specific portion of the work~~ will be made, unless the Engineer revises the plan dimensions through an approved change order.
 2. ~~a. The Department Engineer will revise~~adjusts the final quantities-quantity for payment ~~in by~~ the amount ~~of represented by the authorized changes in the dimensions if revised dimensions result in an~~ increase or decrease ~~in the quantities to the estimated quantity in the bid proposal represented by authorized changes in dimensions. of work.~~
 2. Request an adjustment to the final quantity for payment if an error is discovered in the estimated quantity in the bid proposal.
- E. ~~When requesting additional compensation on the basis of adjustment to quantities in the bid proposal for items paid as "plan quantity," provide all computations, plots, and supporting documentation necessary for the Engineer to evaluate and verify adjusted quantities.~~
- a. ~~a. Provide all computations, plots, and supporting documentation necessary for the Engineer to verify the error and determine the final quantity for payment.~~
 - b. All work associated with providing computations, plots, and supporting documentation is at no cost to the Department, except:
 - 1) ~~When the Engineer revises plan dimensions.~~
 - 2) When the adjusted quantity differs from the plan quantity by more than 10 percent, wWork required to provide computations, plots, and supporting documentation ~~will~~ may be paid for as extra work when the final quantity differs from the estimated quantity by more than 10 percent.
- C. Lump sum or each:
1. The Department measures the complete structure or structural unit, signal or lighting system, or other items of work specified in the bid proposal to be measured by lump sum or each to include all necessary work, fittings, and accessories for a complete unit or system.
- D. Length:
1. Items measured by the foot such as pipe culverts, guardrail, underdrains, etc. are measured parallel with the base or foundations upon which the structures are placed.
 2. The term "station" when used as a definition or term of measurement is 100 linear feet.
- E. Area:

1. Unless otherwise specified, the Department uses horizontal longitudinal and plan (neat) transverse measurements.

F. Volume:

1. The Department measures structures using plan (neat) dimensions, or altered dimensions when approved by the Engineer to fit field conditions.
2. The Department uses average end area or computer generated Digital Terrain Model (DTM) method for computing volumes of excavation.
3. Materials specified to be measured by the cubic yard may be weighed and converted to cubic yard for payment purposes, when requested by the Contractor and approved by the Engineer in writing.
 - a. Agree to the factors for conversion from weight measurement to volume as determined by the Engineer before using this method of measurement for computing pay quantities.

G. Weight:

1. The term "ton" means 2000 pounds avoirdupois.
2. Measure aggregate weight in the saturated surface dry condition.

F. ~~Measurements for area computations:~~

1. ~~Longitudinal measurements: made horizontally.~~
2. ~~Transverse measurements: the neat dimensions shown on the plans.~~

G. ~~Computing volumes of excavation:~~

~~Average end area method, or computer generated Digital Terrain Model (DTM) method, unless the Engineer and Contractor agree in writing to an alternate method.~~

H. ~~Measure complete structure or structural unit, signal or lighting system, (lump sum) unit to include all necessary fittings and accessories.~~

I. ~~Structures:~~

~~Neat lines shown on the plans or as altered to fit field conditions.~~

JH. Standard manufactured items (such as fence, wire, plates, rolled shapes, pipe conduit, etc.), are identified by gauge, unit, weight, section dimensions, etc.:

1. ~~Identification will be nominal weights or dimensions.~~
21. Unless otherwise specified, the Department uses Use nominal weights or dimensions and industry-manufacturing tolerances, unless more stringently controlled by specifications.

K. ~~Items measured by the foot, (pipe culverts, guardrail, underdrains, etc.):~~

~~Measure parallel with the base or foundations upon which structures are placed.~~

~~L.I. The thickness of plates and galvanized sheet used in the manufacture of corrugated metal pipe, metal plate pipe culverts and arches, and metal cribbing:~~
~~1. measured The Department measures thickness in fractions of inches.~~

~~M. Materials specified to be measured by the cubic yard may be weighed and converted to cubic yard for payment purposes, when requested by the Contractor and approved by the Engineer in writing. Engineer determines and Contractor agrees to the factors for conversion from weight measurement to volume before this method of measurement of pay quantities is used.~~

~~N. Rental of equipment: measure hours of actual working time and necessary traveling time of the equipment within the limits of the project.~~
~~1. If the Engineer orders special equipment in connection with force account work, the Department measures travel time and transportation to the project.~~
~~2. If the Engineer orders equipment held on the project on a standby basis, the Department pays the agreed rental rate minus the operating cost.~~

~~1.4 MEASUREMENT OF QUANTITIES - MATERIALS~~

~~A. Asphalt materials: gallon or ton.~~
~~1. Department measures volumes at 60 degrees F or corrects to the volume at 60 degrees F using ASTM D 1250 for asphalts or ASTM D 633 for tars.~~
~~2. Department uses net certified scale weights or weights based on certified volumes in the case of rail shipments as a basis of measurement, subject to correction when asphalt material has been lost from the car or the distributor, wasted, or otherwise not incorporated in the work.~~
~~3. When asphalt materials are shipped by truck or transport, net certified weights or volume subject to correction for loss or foaming may be used for computing quantities.~~

~~B. Cement: ton~~

1.51.2 WEIGHING REQUIREMENTS AND PROCEDURES

A. Weigh all materials that are measured or proportioned by weight, or contract items measured by the ton, such as aggregates and asphalt materials, on scales that have been approved, certified, and which meet specification requirements.
1. Obtain certified haul truck tares at times as directed by the Engineer and place a legible identification mark on each truck.
2. The Department may return any loads of material that appear to be deficient or questionable to be reweighed.

- B. Furnish, erect, have certified, and maintain, or use permanently installed and certified commercial scales for weighing highway and bridge construction materials that are required to be proportioned or measured and paid for by weight:
1. Scales must be accurate within the limits set by the laws of the State of Utah, meeting requirements of the U.S. Bureau of Standards.
 2. Scales must bear a current seal of acceptance from the State of Utah Department of Agriculture, Division of Weights and Measures.
 3. Have the Utah State Department of Agriculture Division of Weights and Measures inspect and seal all scales at least once a year and after each setup before use, or as requested by the Engineer.
 4. Install and maintain platform scales with the platform level and with rigid bulkheads at each end.
 - a. Platform scales must be of adequate size and capacity so the entire power unit and hauling unit can be weighed at the same time.
 5. Physically arrange electronic, beam, dials, platform, and other scale equipment for convenient and safe viewing by the operator and inspector.
- C. Include costs for furnishing, installing, certifying or testing, and maintaining scales, furnishing scale house, materials for proportioning or payment, and all other items specified in this section for the weighing of highway and bridge construction materials in the unit contract prices for the various pay items of the contract.
- D. Request written approval to use alternate weighing devices.

- ~~B. If material is shipped by rail, the car weight may be accepted provided only the actual weight of material will be paid for.~~
- ~~1. Car weights are not acceptable for material processed through mixing plants.~~
 - ~~2. Weigh trucks used to haul material empty daily at times as directed by the Engineer, and place on each truck a legible identification mark.~~
- ~~C. An inspector observes materials delivered to the project or designated site.~~
- ~~1. Submit the printed or written haul ticket to Inspector.~~
 - ~~2. At this time, the Inspector can accept materials, and initial and retain the ticket.~~
 - ~~3. Department may return any loads of material that appear to be deficient or questionable to be reweighed.~~

1.6 SCALES

- ~~A. Have the Utah State Department of Agriculture, Division of Weights and Measures inspect and seal all scales at least once a year, and before use each time the scale is moved or adjusted.~~

- ~~B. Scale accuracy: to within 0.5 percent of the maximum load required.~~
- ~~C. Furnish, erect, have certified, and maintain, or use permanently installed and certified commercial scales for weighing highway and bridge construction materials that are required to be proportioned or measured and paid for by weight:
 - ~~1. Scales must be accurate within the limits set by the laws of the State of Utah, meeting requirements of the U.S. Bureau of Standards.~~
 - ~~2. Scales must bear a current seal of acceptance from the State of Utah Department of Agriculture, Division of Weights and Measures.~~~~
- ~~D. Physically arrange electronic, beam, dials, platform, and other scale equipment for convenient and safe viewing.~~
- ~~E. Cease using scales that overweigh (indicate more than true weight). Reduce all materials received subsequent to the last previous correct weighing accuracy test by the percentage of error in excess of one half of 1 percent.~~
- ~~F. Adjust scales that underweigh (indicating less than true weight). Department will allow no additional payment to the Contractor for materials previously weighed and recorded.~~
- ~~G. Include in the unit contract prices for the various pay items of the Contract, costs for furnishing, installing, certifying or testing, and maintaining scales, furnishing scale house, materials for proportioning or payment, and all other items specified in this section for the weighing of highway and bridge construction materials~~

~~1.7 PLATFORM SCALES~~

- ~~A. Install and maintain a level platform with rigid bulkheads at each end.~~
- ~~B. Must be of adequate size and capacity so the entire power unit and hauling unit can be weighed at the same time.
 - ~~1. The Contractor may use a platform scale that will accommodate the power unit and the first hauling unit and all remaining hauling units in two weighing operations.~~
 - ~~2. When using two weighing operations, provide a level approach at both ends of the scale at least 75 ft in length composed of a base course and a minimum of 3 inches of Hot Mix Asphalt or 3 inches of concrete cement pavement.~~
 - ~~3. Repair or replace approach grades, or any portion that varies by more than one tenth of one percent, or revert to weighing the entire power unit and hauling units at the same time.~~~~

~~C. Contractor is responsible for costs for constructing and maintaining the approaches.~~

~~1.8 ELECTRONIC HOPPER SCALE REQUIREMENTS~~

~~A. The Contractor has the option of furnishing an electronic hopper scale system. When this type of weighing system is used, the following applies:~~

- ~~1. Use hopper or load cells.~~
- ~~2. Weights must be accurate to 1.0 percent of true weights.~~
- ~~3. Provide an automatic printer that will provide the following information:~~
 - ~~a. Project number and name~~
 - ~~b. Date~~
 - ~~c. Time~~
 - ~~d. Ticket number~~
 - ~~e. Haul unit number~~
 - ~~f. Gross weight (if possible)~~
 - ~~g. Tare weight~~
 - ~~h. Net pounds or tons~~
 - ~~i. A minimum of two copies of each ticket~~
 - ~~j. Description of item~~

~~B. Maintain electronic and hopper scales and conduct necessary testing to assure continued scale accuracy within specification limits after certification by the Department of Agriculture and required by specification.~~

~~C. Comparison Test: The accuracy of the hopper scale may be checked by comparing the weight of the material from the hopper and the weight of the material after it is weighed on another certified scale. Comparisons within 0.5 percent tolerance or within the combined tolerance of the two scales are acceptable.~~

~~D. If no platform scales are readily available, use known weights to occasionally recalibrate the scales by hanging weights from the weigh hopper.~~

~~E. Furnish weights equal to 12.5 percent of capacity and of known accuracy. Use a buildup procedure in combination with the weights by batching or placing a measured amount of material in the hopper and adding known weights to verify.~~

~~F. Request written approval to use alternate weighing devices.~~

~~1.9 DEPARTMENT INSPECTION AND VALIDATION OF WEIGHTS~~

~~A. Continuous observation:~~

1. ~~The Department may provide a scale person to weigh or observe the weighing of equipment or trucks loaded and empty to determine the net weight of materials to be hauled.~~

a. ~~The scale person issues a weigh ticket at the scale site when the Contractor provides truck scales without automatic printers.~~

~~B. Random weighing:~~

1. ~~Use when a Department scale person does not weigh materials, or when an electronic scale with an automatic printer is used for weighing equipment, trucks, or materials.~~

2. ~~The Engineer validates the equipment, truck, and material weight by random reweighing or by other methods selected by the Engineer.~~

~~C. The Engineer or representative randomly checks the weight of the equipment, trucks, and the material indicated on the weight ticket by reweighing the loaded truck on another certified scale, if available.~~

1. ~~If no other platform scales are available, the Engineer may check by operating the scale in the manual mode.~~

2. ~~When manual verification is used, the Engineer reweighs the truck by running it back over the platform scale to manually check weights.~~

~~D. Conduct frequent checks at the beginning of the operations to verify proper scale function and accuracy.~~

1. ~~Frequency may be reduced after initial verification to a minimum of once per week when a substantial amount of material is being weighted.~~

2. ~~Scale Tests: Maintain scales and conduct necessary testing to verify scale accuracy within the specifications.~~

a. ~~When the scale does not meet specified tolerance, discontinue using the scale until it is operating within specifications.~~

b. ~~Comparison scale checks must be within a 0.5 percent tolerance of the net load or within the combined tolerance of the two scales or two weights.~~

PART 2 PRODUCTS Not used

PART 3 EXECUTION Not used

END OF SECTION

Standards Committee Submittal Sheet

Name of preparer: Michael Romero, Karl Verhaeren

Title/Position of preparer: Structures Engineer, Engineer for Construction

Specification/Drawing/Item Title: 02056 - EMANKMENT, BORROW, AND BACKFILL

Specification/Drawing Number: 02056 - DD-16

Enter appropriate priority level:

(See last page for explanation)

3

Sheet not required on editorial or minor changes to standards. Check with Standards Section.

NOTES:

1. All Submittal Sheets must be completed and sent to the Standards and Specifications Section by the Standards Committee suspense date as shown on the Web.
(<http://www.udot.utah.gov/index.php/m=c/tid=303>)
2. The Preparer of the Submittal Sheet or the Standards Committee member (or authorized substitute) responsible for the submittal must be present at the Standards Committee meeting and capable of discussing and answering all questions related to the submittal. The item will be postponed to a later meeting if one of these people is not present.
3. Notify the Standards and Specifications Section immediately of any changes that impact the presentation to include absence of sponsor or delay in presentation.

Complete the following: (Use additional pages as needed.)

- A. Why? Detail the reason for changing the Standard (Specification or Drawing), what has initiated a new Standard, or what has caused a new or changed item of interest.

In order to include most all information concerning embankments in a single section, the embankment for bridge specification has been deleted and the provisions have been included in section 02056 - Embankment, Borrow, and Backfill. There has also been the addition of a proposed standard drawing (DD-16) to better define the limits for the Embankment for Bridge placement and give the design engineers so guidance in calculating the plan quantities.

- B. How is Measurement and Payment handled? Existing (from the measurement and payment document), modified, or new measurement and payment to be included with all Standard Specifications or Supplemental Specifications.

As follows:

Section 02332: ~~Embankment for Bridge~~

#	023320010	Embankment for Bridge	Cubic Yard
---	------------------	------------------------------	-------------------

#	023320020	Embankment for Bridge	Ton
---	------------------	------------------------------	------------

Section 02056: Embankment, Borrow, and Backfill

#	020560005	Borrow (Plan Quantity)	Cubic Yard
In final position			

#	020560010	Borrow	Ton
In final position			

#	020560015	Granular Borrow (Plan Quantity)	Cubic Yard
In final position			

#	020560020	Granular Borrow	Ton
In final position			

#	020560025	Granular Backfill Borrow (Plan Quantity)	Cubic Yard
---	------------------	---	-------------------

#	020560055	Free Draining Granular Backfill	Ton
---	------------------	--	------------

#	020560060	Free Draining Granular Backfill (Plan Quantity)	Cubic Yard
---	------------------	--	-------------------

#	<u>020560070</u>	<u>Embankment for Bridge (Plan Quantity)</u>	<u>Cubic Yard</u>
---	-------------------------	---	--------------------------

#	<u>020560075</u>	<u>Embankment for Bridge</u>	<u>Ton</u>
---	-------------------------	-------------------------------------	-------------------

C. Stakeholder Notification for AGC and ACEC:

By email provide the AGC and ACEC Standards Committee member a copy of all pertinent information relating to the specification or drawing. Detail all responses below. Indicate if no comments were received.

Note: There is a two-week response time set for this item.

Refer to the Standards Committee Web site, Members page at <http://www.udot.utah.gov/index.php/m=c/tid=659> for the respective e-mail addresses.

AGC Comments: (Use as much space as necessary.)

Distributed March 21, 2007. No Comments Received as of March 30, 2007.

ACEC Comments: (Use as much space as necessary.)

Distributed March 21, 2007. No Comments Received as of March 30, 2007.

- D. Stakeholders? From the list provided, document the stakeholders contacted, detailing: the company, name of contact, how contacted (by phone, email, hard copy, or in person), concerns, and comments of the change. Stakeholders:

Note: There is a two-week response time set for this item. Allow Stakeholders two weeks to process and respond to coordination requests. All areas should try to complete review and comment as soon as possible but within two weeks.

In-house (for example, preconstruction, materials, construction, safety, design, maintenance) (Include all applicable in-house areas even if not listed above.)

Construction Engineers

Dennis Simper	Robert Dowell
Rob Wight	Scott Munson
Scott Andrus	Hugh Kirkham
Bob Westover	Karl Verhaeren

Contractors (Any additional contacts beyond “C” above.) **N/A**

Suppliers **N/A**

Consultants (as required) (Any additional contacts beyond “C” above.) **N/A**

FHWA (To be accomplished as part of the two-week process before submitting to the Standards and Specifications Section for inclusion on the Standards Committee agenda.) (This is in addition to the requirements of UDOT Policy 08A5-1, procedure 08A5-1.3.)

Distributed March 21, 2007.

Russ Robertson

Anthony Sarhan

Others (as appropriate)

Preconstruction Engineers

Rex Harris

Bill Lawrence

Brent Schvaneveldt

Mike Miles

Robert Mile

Material Engineers

Rodney Terry

John Butterfield

Jim Cox

Larry Gay

Tim Biel

- E. Other impacted areas, systems, or personnel. (Consider all impacts and possible changes to these areas during the preparation process. Coordinate with all appropriate areas for the respective item. List all impacts and action taken.)
1. Minimum Sampling and Testing Guide (MS&T Guide)
Minimum Sampling and Testing Requirements will be included in section 02056.
 2. Business Systems (Electronic Bid System, Project Development Business System, Electronic Program Management, Computer-Aided Drafting and Design, etc.)
N/A
 3. Implementation Plan (Provide detailed instructions on how the subject item will be implemented to include notification of all interested parties and training requirements.)
Information will be distributed in addition to Standards Updates
- F. Costs? (Estimates are acceptable.)
1. Additional costs to average bid item price.
There should be no additional cost to the average bid items. This change combines related specs and defines the limits of placement.
 2. Operational (For example, maintenance, materials, equipment, labor, administrative, programming).
N/A
 3. Life cycle cost.
N/A
- G. Benefits? (Provide details that can be used to complete a Cost – Benefit Analysis.) (Estimates are acceptable.) (If no costs, what is the benefit of making this change?)
- Better definition of the limits for placement of Embankment for Bridge for both the contractor and designer.**
- H. Safety Impacts? **None**
- I. History? Address issues relating to the current usage of the item and past reviews, approvals, and/or disapprovals.
- During the construction process there has been confusion with were the limits for Embankment for Bridge should be placed. The proposed drawing DD-16 sets the limits of placement for three scenarios approach embankments, adjoining embankments, and intersection roadway embankments.**

Section 02332 was originally proposed to be included with other sections that were combined into supplemental section 02056 in November 2006, but there was ongoing discussion at that time about potential changes to the existing standard section 02332 requirements. It was therefore excluded, essentially because of not being ready at that time.

Priority Explanation

Enter the appropriate priority in the box on the first page of the document.

- | | |
|------------|---|
| Priority 1 | Upon posting, this impacts all projects in construction and design with a Change Order, Addenda, and immediate change to projects being advertised. |
| Priority 2 | Upon posting, this impacts projects being advertised. |
| Priority 3 | Upon posting, the approved standard takes effect four weeks later for projects being advertised. |

**Supplemental Specification
2005 Standard Specification Book**

SECTION 02056

EMBANKMENT, BORROW, AND BACKFILL

Delete Section 02056, 02061, 02324, ~~and 02330~~, and 02332 in their entirety and replace with the following: (References in other UDOT Specification Sections have not been updated.)

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Materials and procedures for construction of embankment, ~~and backfill~~, and bridge approach embankments.

1.2 RELATED SECTIONS

- A. Section 02231: Site Clearing and Grubbing

- B. Section 02317: Structural Excavation

- ~~C. Section 02332: Embankment for Bridge~~

- ~~DC.~~ Section 02912: Topsoil

- D. Section 03575: Flowable Fill

1.3 REFERENCES

- A. AASHTO M 145: Classification of Soils and Soil-Aggregate Mixtures for Highway Construction Purposes
- B. AASHTO T 11: Materials Finer than 75 µm (No. 200) Sieve in Mineral Aggregates by Washing
- C. AASHTO T 27: Sieve Analysis of Fine and Coarse Aggregates
- D. AASHTO T 99: Moisture-Density Relations of Soils Using a 2.5 kg (5.5-lb) Rammer and a 305 mm (12 in.) Drop
- E. AASHTO T 180: Moisture-Density Relations of Soils Using a 4.54 kg (10-lb) Rammer and a 457 mm (18 in.) Drop

Embankment, Borrow, and Backfill

02056 - Page 1 of 65

November 30, 2006

Doc
Page
86

F. UDOT Minimum Sampling and Testing Requirements

1.4 SUBMITTALS

- A. Before delivering material to the project, submit:
1. Supplier and source of materials
 2. Gradation analysis AASHTO T 27 / T 11
 3. Soil classification when applicable AASHTO M 145
 4. Maximum Dry Density and Optimum Moisture Determination AASHTO T 99 Method D or AASHTO T 180 Method D for A-1 soils.

1.5 ACCEPTANCE

- A. Acceptance sampling and testing of material is in accordance with UDOT Minimum Sampling and Testing Requirements.
- B. Engineer reserves the right to select and test material randomly from any location at the construction site.
- C. Density Requirement: Acceptance is on a lot-by-lot basis when average density is not less than 96 percent of maximum laboratory density, and no single determination is lower than 92 percent. AASHTO T 99 Method D or AASHTO T 180 Method D for A-1 soils.
- D. Remove any material found defective and replace with acceptable material at no additional cost to the Department.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Provide materials free of contamination from chemical or petroleum products for embankment and backfill placements. Materials may include recycled Portland Cement concrete.

2.2 BORROW

- A. Classifications A-1-a through A-4. Meet AASHTO M 145

2.3 GRANULAR BORROW

- A. Classification A-1-a. Meet AASHTO M 145
- B. Non-plastic, well-graded, 3-inch maximum
Embankment, Borrow, and Backfill

2.4 GRANULAR BACKFILL BORROW

- A. Classification A-1-a. Meet AASHTO M 145
- B. Non-plastic, well-graded, 2-inch maximum

2.5 EMBANKMENT FOR BRIDGE

- A. Granular Borrow

2.5.2.6 FREE DRAINING GRANULAR BACKFILL

- A. Meet the following gradation:

Table 1	
Free Draining Granular Backfill Gradation	
Sieve Size	Percent Passing
1-1/2 inch	100
1 inch	95 to 100
1/2 inch	25 to 60
No. 4	0 to 10

2.7 FLOWABLE FILL

- A. Refer to Section 03575

2.6 EMBANKMENT FOR BRIDGE

- A. Refer to Section 02332.

PART 3 EXECUTION

3.1 PREPARATION

- A. Complete clearing and grubbing and stripping and stockpiling topsoil before placing embankment. Refer to Sections 02231 and 02912.
- B. Excavate and dispose of unsuitable material as directed by the Engineer.

3.2 EMBANKMENT PLACEMENT

- A. Place roadway excavation or borrow in embankment section with the highest quality material in the top portion of the embankment.
- B. Scarify and compact the top 8.0 inches of the surface to at least 90 percent of maximum laboratory density when the embankment height is 6.0 ft or less and the underlying ground consists of loose material.
- C. Break and scarify all underlying road surfaces in so that pieces do not exceed 3 ~~ft~~²sq ft. (This now conflicts with our Spec Writers' Guide. Need to change back to the original. Barry A.)
- D. Maintain drainage.
 - 1. Grade and maintain the roadway to ensure adequate drainage.
 - 2. Maintain pipe culverts and drainage ditches, or provide temporary facilities when interrupting irrigation systems, sewer, underdrainage, etc.
- E. Place an initial layer to act as a working platform over soft, wet ground when approved by the Engineer.
 - 1. Density specifications do not apply to the working platform.
 - 2. Meet density requirements for embankment placed above the working platform.
- F. The Engineer inspects and accepts the working platform or foundation before embankment is placed.
- G. Spread embankment materials uniformly in layers not exceeding 1 ft (uncompacted depth) and compact to an average of 96 percent maximum laboratory density before placing the next layer. Reduce the lift thickness if tests show unsatisfactory density.
- H. Finish subgrade surface within ± 0.1 ft of line and grade.
- I. Do not use rock or pavement materials over 3 ft in any dimension. Distribute so space exists for placing and compacting embankment material between large rocks or pavement materials.
- J. Do not place large rock within 1 ft of the subgrade surface. Do not allow rocks to protrude above the subgrade surface.
- K. Do not use compacting equipment that causes shear failure in the embankment.

3.3 GRANULAR BORROW AND BACKFILL PLACEMENT

- A. Finish granular borrow surface within ± 0.1 ft of line and grade.

Embankment, Borrow, and Backfill

02056 - Page 4 of 65

November 30, 2006

Doc
Page
89

- B. Structural Backfill Placement (includes bridges, foundation, box culverts, pipe culverts, drains and other structures)
1. Place suitable backfill material in structural backfill sections. Refer to Sections 02317 and 02332.
 - a. Use granular backfill borrow when specified.
 2. Use appropriate compaction equipment adjacent to abutments, backwalls, approach slabs, wing walls, retaining walls, and other structures.
 3. Compact backfill material in 6-inch layers to a 96 percent density.
- C. Free Draining Granular Backfill
1. Excavate a trench 3 inches below the underdrain pipe flow-line. Widen to 2 ft plus the outside diameter of the underdrain pipe.
 2. Place free draining granular backfill in the trench and compact the bottom 3 inches with two passes of a vibratory roller.
 3. Back fill to 12 inches above top of pipe with free draining granular backfill.
 4. Compact backfill material in 6-inch layers to a 96 percent density when placing under a roadway.

3.4 EMBANKMENT FOR BRIDGE PLACEMENT

- A. Construct approach embankments from the original existing ground up with the specified material to the limits defined herein and in accordance with DD series Standard Drawings.
1. Approach Embankments
 - a) Embankment placed beneath the bridge, except riprap or other specified materials used for MSE walls.
 - b) Embankment placed from the bridge abutment centerline station to a point measured at least 300 ftfeet away from the abutment along the approach roadway centerline; and placed for embankment on the inside of abutments.
 - c) Where retaining walls are located beyond this delineation, use the specified material throughout the length of the walls.
 2. Intersecting Roadway Embankments
 - a) Embankment placed from approximate edge of approach roadway a length of at least 60 ftfeet along intersecting roadway centerline.
 3. Adjoining Embankments
 - a) When adjoining embankment is not an approach embankment, embankment placed to at least 9 ftfeet outward from edge of approach roadway pavement.
- A. Over-excavate unsuitable material (soft, springy, organic, or otherwise yielding material) at natural ground level as directed by the Engineer.

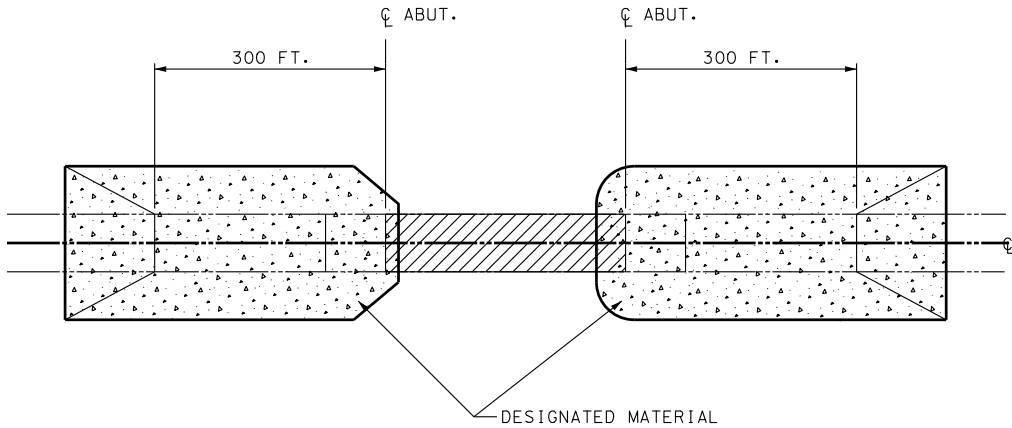
- B. The Engineer inspects and accepts the working platform or foundation before embankment is placed.
- C. Spread embankment materials uniformly in layers not exceeding 1 ft (uncompacted depth) and compact to an average of 96 percent maximum laboratory density before placing the next layer. Reduce the lift thickness if tests show unsatisfactory density.
- D. Finish surface within ± 0.1 ft of line and grade.

3.4 LIMITATIONS

- A. Requirements when working during freezing or snowy conditions:
 - 1. Do not place embankment on frozen or snow-covered areas.
 - 2. Do not deliver or use frozen material in embankments.
 - 3. Remove snow and frozen material from embankments, foundations, and borrow areas, and furnish embankment material that can be compacted to the specified density.
 - 4. Remove, waste, and replace frozen embankment material at no additional cost to the Department.
 - 5. Measure wasted material and provide quantities to the Engineer.

END OF SECTION

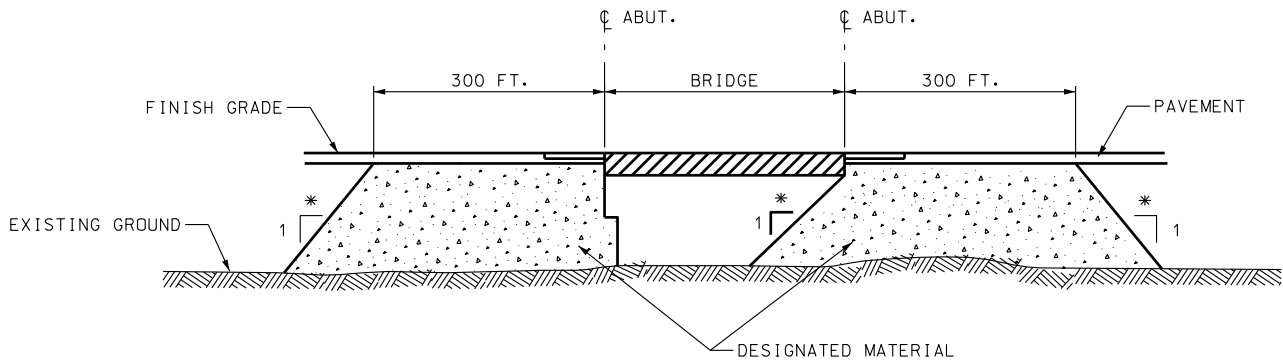
11-APR-2007 DGN File: L:\Standard Drawings\Imperial\2005\Working\Design 00\IND016.dgn



* THEORETICAL SLOPE MAXIMUM OF 1:1 TO TRANSITION BETWEEN EMBANKMENT MATERIALS.

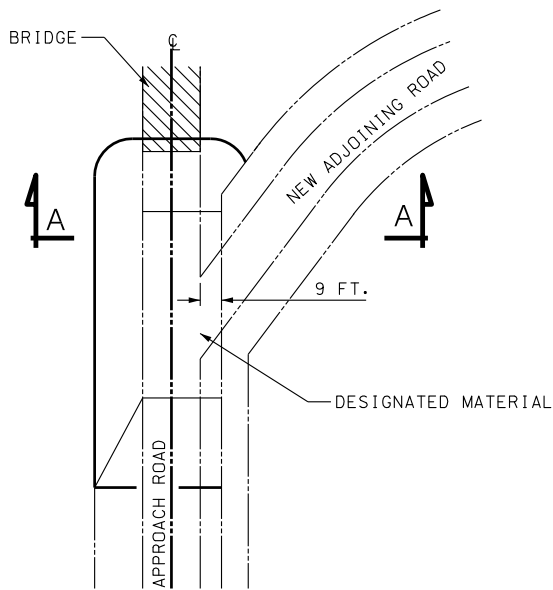
PLAN VIEW APPROACH EMBANKMENTS

NTS



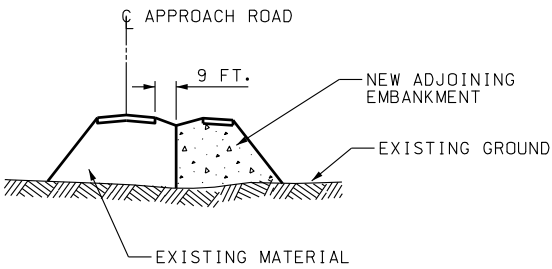
CL PROFILE VIEW APPROACH EMBANKMENTS

NTS



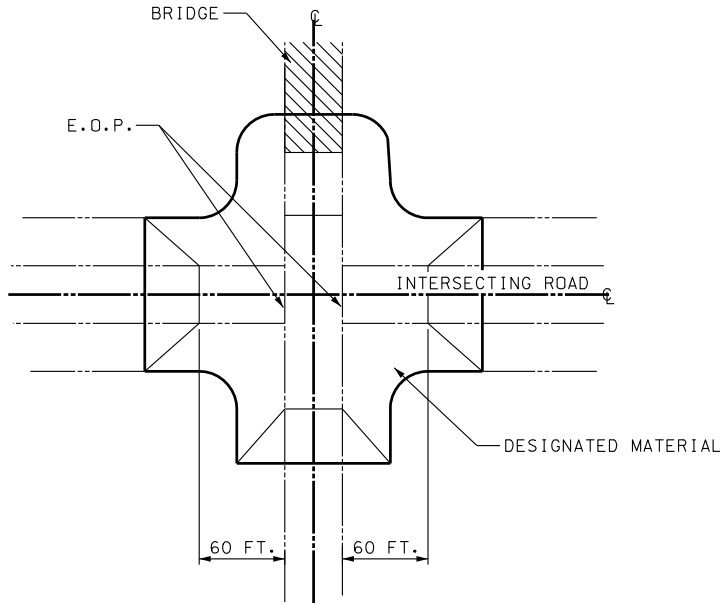
PLAN VIEW ADJOINING EMBANKMENTS

NTS



SECTION A-A VIEW

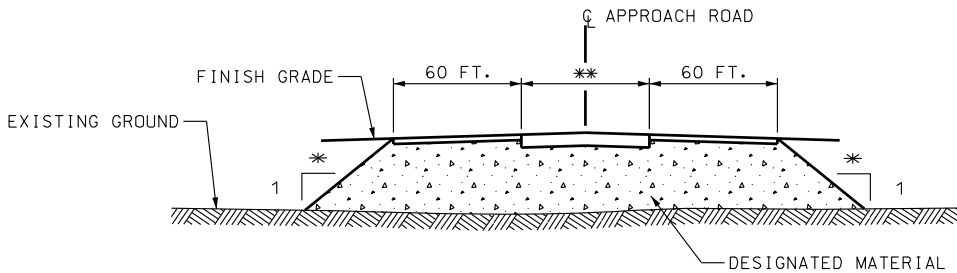
NTS



PLAN VIEW INTERSECTING ROADWAY EMBANKMENTS

NTS

* THEORETICAL SLOPE MAXIMUM OF 1:1 TO TRANSITION BETWEEN EMBANKMENT MATERIALS.



CL PROFILE VIEW INTERSECTING ROADWAY EMBANKMENTS

NTS

** INDICATES EDGE OF PAVEMENT TO EDGE OF PAVEMENT DIMENSION.

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION

STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION

SALT LAKE CITY, UTAH

RECOMMENDED FOR APPROVAL

CHAIRMAN STANDARDS COMMITTEE
APPROVED

DEPUTY DIRECTOR

STANDARD DRAWING TITLE

EMBANKMENT FOR
BRIDGE PLACEMENT

STD. DWG. NO.
DD 16

REMARKS

NO. DATE APPR.

JAN.01.2005 DATE

JAN.01.2005 DATE

**Supplemental Specification
2005 Standard Specification Book**

SECTION 02332

EMBANKMENT FOR BRIDGE

Delete Section 02332 in its entirety. Refer to Section 02056: Embankment, Borrow, and Backfill

Standards Committee Submittal Sheet

Name of preparer: Karl Verhaeren

Title/Position of preparer: Engineer for Construction

Specification/Drawing/Item Title: 01452: Profilograph and Pavement Smoothness

Specification/Drawing Number: _____

Enter appropriate priority level:

(See last page for explanation)

3

Sheet not required on editorial or minor changes to standards. Check with Standards Section.

NOTES:

1. All Submittal Sheets must be completed and sent to the Standards and Specifications Section by the Standards Committee suspense date as shown on the Web.
(<http://www.udot.utah.gov/index.php/m=c/tid=303>)
2. The Preparer of the Submittal Sheet or the Standards Committee member (or authorized substitute) responsible for the submittal must be present at the Standards Committee meeting and capable of discussing and answering all questions related to the submittal. The item will be postponed to a later meeting if one of these people is not present.
3. Notify the Standards and Specifications Section immediately of any changes that impact the presentation to include absence of sponsor or delay in presentation.

Complete the following: (Use additional pages as needed.)

- A. Why? Detail the reason for changing the Standard (Specification or Drawing), what has initiated a new Standard, or what has caused a new or changed item of interest.

Revisions are intended to help clarify contractor's requirement for testing and correction of shoulder profile defects. Other revisions include allowance for measuring equipment other than the California type profilograph and elimination of Contractor Quality Control Plan.

- B. How is Measurement and Payment handled? Existing (from the measurement and payment document), modified, or new measurement and payment to be included with all Standard Specifications or Supplemental Specifications.

N/A

- C. Stakeholder Notification for AGC and ACEC:

By email provide the AGC and ACEC Standards Committee member a copy of all pertinent information relating to the specification or drawing. Detail all responses below. Indicate if no comments were received.

Note: There is a two-week response time set for this item.

Refer to the Standards Committee Web site, Members page at <http://www.udot.utah.gov/index.php/m=c/tid=659> for the respective e-mail addresses.

AGC Comments: (Use as much space as necessary.)

Sent to Norm Avery (WW Clyde) and Mont Wilson (Granite) on February 6, 2007 for review and comment.

Comments requested by March 1, 2007.

ACEC Comments: (Use as much space as necessary.)

Sent to ACEC on February 6, 2007 for review and comment.

Comments requested by March 1, 2007.

- D. Stakeholders? From the list provided, document the stakeholders contacted, detailing: the company, name of contact, how contacted (by phone, email, hard copy, or in person), concerns, and comments of the change. Stakeholders:

Note: There is a two-week response time set for this item. Allow Stakeholders two weeks to process and respond to coordination requests. All areas should try to complete review and comment as soon as possible but within two weeks.

In-house (for example, preconstruction, materials, construction, safety, design, maintenance) (Include all applicable in-house areas even if not listed above.)

District Engineers

Sent to District Engineers and Resident Engineers on February 6, 2007 for review and comment.

Comments requested by March 1, 2007.

Contractors (Any additional contacts beyond "C" above.)

Suppliers

Consultants (as required) (Any additional contacts beyond "C" above.)

FHWA (To be accomplished as part of the two-week process before submitting to the Standards and Specifications Section for inclusion on the Standards Committee agenda.) (This is in addition to the requirements of UDOT Policy 08A5-1, procedure 08A5-1.3.)

Sent to FHWA February 6, 2007 for review and comment.

Comments requested by March 1, 2007.

Others (as appropriate)

Sent to all members of the Standards Committee on February 6, 2007 for review and comment.

Comments requested by March 1, 2007.

Sent to Region Materials Engineers on February 6, 2007 for review and comment.

Comments requested by March 1, 2007. The changes were discussed at the RME meetings of February 1 and March 1, 2007 with no other changes recommended.

- E. Other impacted areas, systems, or personnel. (Consider all impacts and possible changes to these areas during the preparation process. Coordinate with all appropriate areas for the respective item. List all impacts and action taken.)
1. Minimum Sampling and Testing Guide (MS&T Requirements)
N/A
 2. Business Systems (Electronic Bid System, Project Development Business System, Electronic Program Management, Computer-Aided Drafting and Design, etc.)
N/A
 3. Implementation Plan (Provide detailed instructions on how the subject item will be implemented to include notification of all interested parties and training requirements.)
N/A
- F. Costs? (Estimates are acceptable.)
1. Additional costs to average bid item price.
N/A
 2. Operational (For example, maintenance, materials, equipment, labor, administrative, programming).
N/A
 3. Life cycle cost.
N/A
- G. Benefits? (Provide details that can be used to complete a Cost – Benefit Analysis.) (Estimates are acceptable.) (If no costs, what is the benefit of making this change?)
- No cost change – revisions intended for clarification of requirements and intent**
- H. Safety Impacts?
N/A

- I. History? Address issues relating to the current usage of the item and past reviews, approvals, and/or disapprovals.
N/A

Priority Explanation

Enter the appropriate priority in the box on the first page of the document.

- | | |
|------------|---|
| Priority 1 | Upon posting, this impacts all projects in construction and design with a Change Order, Addenda, and immediate change to projects being advertised. |
| Priority 2 | Upon posting, this impacts projects being advertised. |
| Priority 3 | Upon posting, the approved standard takes effect four weeks later for projects being advertised. |

Supplemental Specification
2005 Standard Specification Book

SECTION 01452

~~PROFILOGRAPH AND~~ PAVEMENT SMOOTHNESS

Delete Section 01452 in its entirety and replace with the following:

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Materials-Process and procedures for smoothness-acceptance testing and determination of Incentive/Disincentive for smoothness of ~~(HMA)~~ Hot Mix Asphalt (HMA), Open Graded Surface Course (OGSC), Stone Matrix Asphalt (SMA), and Portland Cement Concrete Pavement (PCCP) using a California type profilograph or profiler, approved and certified by the Department.
- ~~B. Requirements for 25-foot wheel base, California type profilograph with electronic data recording, storing, data reduction, and printing capabilities.~~

1.2 RELATED SECTIONS

- A. Section 02741: Hot Mix Asphalt (HMA)
- ~~B. Section 02748: Prime Coat/Tack Coat~~
- ~~C. Section 02752: Portland Cement Concrete Pavement~~
- ~~D. Section 02786: Open-graded Surface Course (OGSC)~~

~~**1.3 REFERENCES**~~

- ~~A. UDOT Materials Manual of Instruction~~

1.34 GENERAL REQUIREMENTS

- A. Pavement smoothness is determined through Department inspection of Contractor testing using a California type profilograph or profiler, approved and certified by the Department. Certify profilograph operators and equipment through the Department. Engineer verifies certifications.
 - 1. Certify operators and equipment through the Department.
 - 2. Engineer verifies certifications.
- B. Comply with project Traffic Control Plan and all applicable safety requirements when performing profilograph testing.
- C. Contractor Quality Control
 - 1. Comply with requirements identified in Section 02741 and Section 02752.
 - 2. Address the following minimum items in the QCP:
 - a. Identify person(s) responsible for managing smoothness issues and monitoring compliance with requirements.
 - b. Identify equipment used to measure and monitor smoothness along with calibration and correlation information.
 - c. Identify personnel responsible for operation of equipment and their qualifications.
 - d. Identify construction methods employed to obtain smoothness, including:
 - 1) Method of grade control for rotomilling and paving operations.
 - 2) Actions taken to prevent paver from stopping and starting, including any use of additional equipment.
 - 3) Placement of manholes outside of projected wheel paths and methods of matching surface elevations and slopes
 - e. Identify potential problems that could interfere with meeting pavement surface requirements.
 - f. Describe grinding process and operation:
 - 1) Equipment and operators
 - 2) Must grind layout, grade control, sealing process, etc.
 - 3) Schedule

1.45 ACCEPTANCE

- A. After all corrective work has been performed, Notify the Engineer in writing a minimum of at least two working days prior to before scheduling Department inspection of acceptance testing on the final pavement surface, after all corrective work has been performed.
 - 1. Clearly define the areas to be tested for acceptance in the written notification.
 - 2. Do not perform any work on the final surface after acceptance testing, except as directed by the Engineer.

- B. ~~For purposes of determining incentive/disincentive, the~~ Department evaluates the surface by section, defined as:
1. Class I surface, 0.1 mile in length, including the adjacent shoulder. (Refer to Table 1 for definition of Class I surfaces). Begin the initial section(s) at the start of the project. Lay out subsequent sections consecutively to the end of the project.
 - a. Testing consists of a single trace measurement of each wheel path, defined as a continuous parallel line 2.5 ft inside the projected lane or median lines.
 - b. Testing of adjacent shoulders having a design width greater than of 6.0 ft or greater consists of a single trace measurement, approximately centered in the shoulder. ~~Do not test shoulders having a design width 6.0 ft or less.~~
 - c. Determine the Profile Index (PI) by taking the average of all profile traces taken on the section.
 - 1) Include profile trace deviations from manholes, valves, and other facilities in the profile trace, when the contract requires the adjustment or reconstruction of these facilities.
 - 2) Exclude profile trace deviations from manholes, valves, and other facilities in the profile trace, when the contract does not include adjustment or reconstruction of these facilities.
 - 3) Do not measure PI for shoulders having a design width less than 6.0 ft
- ~~C. Begin the initial section(s) at the start of the project. Lay out subsequent sections consecutively to the end of the project.~~
- ~~D. The Department does not measure the PI for Class II surfaces.~~
- ~~ED.~~ The Department evaluates longitudinal and transverse deviations for both Class I and Class II surfaces. Refer to construction requirements under article 3.1.
- ~~FE.~~ If the final lift of pavement cannot be completed due to seasonal limitations, the Department evaluates all roadway sections paved through the final lift and evaluates the remaining final lift of pavement upon completion.

1.56 MEASUREMENT AND PAYMENT PROCEDURE

- A. All work necessary to prepare the pavement for testing, such as but not limited to sweeping, is incidental to the work and is not measured for payment.
1. Include all costs and resources for smoothness testing, preparation and correction in the surfacing bid items.

PART 2 PRODUCTS

Not Used

2.1 — FRAME

A. — Construction:

- 1. — All welded of light weight square aluminum tubing in three separate units of the same dimensions in width and within 6 inches in length of each other.**
- 2. — Design: reinforced truss.**

B. — Length:

- 1. — Effective wheel base of the frame assembly: 25 ft.**
- 2. — Overall length with multiple wheel assemblies attached: not to exceed 35 ft.**

C. — Frame Connections:

- 1. — Indexed with steel location pins or dowels to prevent misalignment of frame assembly.**
- 2. — Secured with quick acting clamps rated at a minimum of 800 lbs each.**

D. — Parts: Each of the three frame units manufactured to allow interchangeable replacement of individual units.

2.2 — WHEEL SUPPORT ASSEMBLIES

A. — Tubing: All welded, light weight square aluminum.

B. — Connections: All connection points between wheel assemblies and frame sections secured with quick acting clamps.

C. — Support wheels: Cast aluminum hubs with ball bearing supported steel axles and cushion rubber tires. Caster wheel assemblies: Ball bearing supported.

D. — Front Wheels: Steerable from the center of the machine.

E. — Rear Wheels: Quick setting manual adjustment to allow for short radius turning, moving laterally, and for trimming to avoid crabbing on superelevations.

2.3 — RECORDING WHEEL

A. — Light weight, 24 inch to 26 inch nominal diameter, and heavy duty spokes.

1. ~~Tire: pneumatic tube type with non-aggressive tread design.~~
2. ~~Frame: all welded of light weight square aluminum tubing. Frame pivot points and rotating shafts supported by sealed ball bearings.~~

2.4 — GENERAL MECHANICAL

- A. ~~All exposed steel components anodized, nickel plated, or zinc plated for corrosion protection.~~
- B. ~~Interchangeable parts.~~
- C. ~~Capable of being broken down in segments that can fit into the back of a standard pickup truck or van for ease of transport.~~
- D. ~~Constructed to allow complete assembly in less than 15 minutes without tools.~~

2.5 — AC POWER GENERATING UNIT

- A. ~~Self-contained, capable of delivering 120 VAC at 60Hz.~~
- B. ~~Mount on the frame with appropriate vibration and shock control hardware.~~

2.6 — MICROCOMPUTER

- A. ~~Control the system by a dedicated on-board microcomputer.~~
- B. ~~The microcomputer components replaceable and interchangeable with like items from the manufacturer's stock to facilitate controller repairs and provide the following minimum operation characteristics:~~
 1. ~~Processor:~~
 - a. ~~Minimal 16-bit microprocessor capable of running at a nominal 8 MHz processing speed.~~
 - b. ~~On-board memory sufficient to store Profile Index (PI) and bump Discrimination software.~~
 - c. ~~RAM memory sufficient to input control parameters and process project documentation variables at the test site.~~
 2. ~~Displacement Transducer Interface:~~
 - a. ~~Contains an analog-to-digital converter compatible with the operating characteristics of the microprocessor.~~
 - b. ~~Include signal conditioning for analog filtering and scaling.~~
 - c. ~~Overall resolution for displacement transducer less than or equal to 0.004 inches.~~

3. ~~Odometer Transducer Interface: Provides digital logic to encode positive or negative signals to microprocessor.~~
4. ~~Clock:~~
 - a. ~~Provides time and calendar functions to microprocessor unit automatically.~~
 - b. ~~Independent battery power required to avoid documentation errors and input data losses caused by on-board power shut downs.~~

~~2.7 TRANSDUCERS~~

- A. ~~Rated to withstand shock, vibration, dust, and extremes of humidity. Operational from -30 degrees C to 100 degrees C.~~
 1. ~~Vertical Displacement Transducer: Resolution of 0.01 inches.~~
 2. ~~Odometer: horizontal resolution of 0.39 inches and operational in either an incrementing or decrementing mode.~~
 3. ~~Temperature transducer: Accurate to ± 1 degree C.~~

~~2.8 PRINTER/PLOTTER~~

- A. ~~Compatible with and provide suitable interfaces with the microprocessor.~~
- B. ~~The data acceptance (baud rate) and buffer storage capacity: adequate to fully register, plot, and accept data from a 4 mph operational run without excessive wait states.~~
- C. ~~Dot matrix mechanism (if applicable): print bar resolution of 100 dots per inch with a row resolution of 200 rows per inch.~~

~~2.9 OPERATOR CONTROL PANEL~~

- A. ~~Located within easy access of the operator and in a location on the profilograph that does not hinder other operational functions or line of sight to testing path.~~
- B. ~~Control panel with a digital display, data input keyboard, observable indicators, (video or screen) and operator actuated control switches.~~
- C. ~~Parameters entered, displayed, and printed as follows (all numeric):~~
 1. ~~Time~~
 2. ~~Date~~
 3. ~~Region, route and pavement~~
 4. ~~Pass number~~
 5. ~~Beginning Station~~
 6. ~~Ending Station~~

7. ~~Odometer~~
8. ~~Blanking band width~~
9. ~~Bump height~~
10. ~~Bump width~~
11. ~~Event marker~~

2.10 ~~REPORTING REQUIREMENTS~~

- A. ~~Determine Profile Index, documentation, reports, outputs, or example, as specified. UDOT Materials Manual, 8-995.~~
- B. ~~Set preprogrammed or operator entered scaling or sensitivity factors at a sensitivity level that to correlate with Department profilographs.~~
- C. ~~Include the following documentation supplied with the Profilograph system:~~
 1. ~~Operator's Manual.~~
 2. ~~Wiring Diagrams.~~
 3. ~~Industry standard part number or name and model numbers for complete subsystems.~~

PART 3 EXECUTION

3.1 HMA, SMA, AND OGSC

- A. Construction Requirements
 1. Construct finished pavement to meet the surface requirements in Table 1.
 2. Identify defects exceeding the limits in Table 1 and correct ~~prior to~~before acceptance testing.
 - a. Analyze the profile using 0.2 inch blanking band.
 - b. Correct defects across the entire width of the traffic lane or shoulder either by grinding with a device approved by the Engineer, or by ~~milling and~~ filling as directed by the Engineer.
 - c. Re-profile for correction verification ~~prior to~~before acceptance testing.
 3. Correct transverse defects where the pavement surface varies more than 1/8 inch from the lower edge of a ~~10-foot~~10-foot straightedge placed perpendicular to the centerline of the roadway.
 4. Seal ~~ground~~ areas that have been ground with asphalt tack coat ~~and blotter material~~.
 - a. Use a tack coat application rate between 0.07 and 0.14 gal/yd².
 - b. ~~Meet blotter material requirements in Section 02748.~~
 5. The Department inspects acceptance testing ~~prior to~~before the placement of Chip Seal Coat, when applicable.

~~Profilograph and~~ Pavement Smoothness

01452 - Page 7 of 11

April 26, 2007

B. Acceptance Testing

1. Perform acceptance testing in accordance with article 1.5.

a. Acceptance testing consists of PI determination for Class I surfaces and determination of compliance with allowable profile deviation for Class II surfaces.

2. Incentive/Disincentive - HMA

~~1.a.~~ Incentive/Disincentive applies only to Class I surfaces for each pavement section defined in this Section, Article 1.5, paragraph B.

~~a.1)~~ Incentive/Disincentive is calculated according to Table 2, with partial sections prorated based on length.

~~b.2)~~ Incentive/Disincentive does not apply to HMA surfaces on projects requiring OGSC or SMA.

~~c.3)~~ Any section requiring grinding exceeding 20 yd² does not qualify for incentive. Disincentive remains applicable for sections where grinding exceeds 20 yd².

~~2.b.~~ Any section still requiring corrective work that is identified at the time of acceptance testing results in loss of incentive for the section. Disincentives remain applicable and are based on PI obtained at the time of acceptance testing.

~~3.c.~~ Failure to correct defects, identified at the time of acceptance testing, within 14 calendar days after notification by the Engineer results in liquidated damages assessed at \$100.00 per day after 14 calendar days per each section needing corrective work.

~~a.1)~~ The Engineer may waive liquidated damages may be waived by the Engineer if when it is determined to be in the best interests of the Department to defer corrective work.

~~C.3.~~ Incentive/Disincentive - OGSC and SMA Surfaces

~~1.a.~~ Incentive/Disincentive applies only to Class I surfaces for each pavement section defined in this Section, article 1.5, Acceptance. Partial sections are prorated based on length and Incentive/Disincentive is calculated according to Table 3, with the following exception:

~~a.1)~~ Incentive/Disincentive is calculated according to Table 3, with partial sections prorated based on length. Any section requiring grinding exceeding 20 yd² or any section still requiring corrective work that is identified at the time of acceptance testing results in a disincentive of \$1000 per section.

~~2.~~ Any section requiring grinding exceeding 20 yd² or any section still requiring corrective work that is identified at the time of acceptance testing results in a disincentive of \$1000.00 per section.

3b. Failure to correct defects, identified at the time of acceptance testing, within 14 calendar days after notification by the Engineer results in liquidated damages assessed at \$100.~~00~~ per day per each section needing corrective work.

a.1) The Engineer may waive ~~L~~liquidated damages ~~may be waived by the Engineer if when~~ it is determined to be in the best interests of the Department to defer corrective work.

3.2 PORTLAND CEMENT CONCRETE PAVEMENT (PCCP)

A. Construction Requirements

1. Construct finished pavement to meet surface requirements listed in Table 1.
2. Identify defects exceeding the limits in Table 1 and correct ~~prior to~~before acceptance testing.
 - a. Analyze the profile using 0.2 inch blanking band.
3. Correct defects across the entire width of the traffic lane or shoulder by grinding with a device approved by the Engineer.
 - a. Re-profile for correction verification ~~prior to~~before acceptance testing.
4. Correct transverse defects where the pavement surface varies more than 1/8 inch from the lower edge of a ~~10-foot~~10-foot straightedge placed perpendicular to the centerline of the roadway.

B. Acceptance Testing

1. Perform acceptance testing in accordance with article 1.5.
 - a. Acceptance testing consists of PI determination for Class I surfaces and determination of compliance with allowable profile deviation for Class II surfaces.
2. Incentive/Disincentive - PCCP
 - ~~1.a.~~ Incentive/Disincentive applies only to Class I surfaces for each pavement section defined in this Section, article 1.5, Acceptance, paragraph B.
 - a.1) Incentive/Disincentive is calculated according to Table 4, with partial sections prorated based on length.
 - 2.b. Any section requiring grinding exceeding 20 yd² does not qualify for incentive.
 - 3.c. Any section still requiring corrective work that is identified at the time of acceptance testing results in loss of incentive for the section. Disincentives remain applicable and are based on PI obtained at the time of acceptance testing.

~~Profilegraph and~~ Pavement Smoothness

4.d. Failure to correct defects, identified at the time of acceptance testing, within 14 calendar days after notification by the Engineer results in liquidated damages assessed at \$100.00 per day per each section needing corrective work.

a.1) The Engineer may waive liquidated damages may be waived by the Engineer if when it is determined to be in the best interests of the Department to defer corrective work.

Table 1

Surface Requirements				
Pavement Category	Class I Surface		Class II Surface	
	Section PI	Profile Deviation	Section PI	Profile Deviation
Category	in/mi	in/25ft	in/mi	in/25ft
1	5	0.3	N/A	0.3
2	7	0.3	N/A	0.3
Category 1	National Highway System and Truck Routes (See Section 02741, Table 11) and all other routes with surfaces having three or more opportunities for improving the ride. *			
Category 2	All other routes incorporating single lift overlays with not more than two opportunities for improving the ride. *			
Class I	Surfaces longer than 1000 ft in length consisting of all traffic and climbing lanes, passing lanes, acceleration and deceleration lanes, ramps, medians wider than 8.0 ft, and turn lanes. Includes bridges and bridge approach slabs with final riding surfaces placed as part of the contract. Excludes horizontal curves having a centerline radius of curvature less than 900 ft and areas within the superelevation transitions to these short radius curves.			
Class II	Surfaces consisting of all tapers, road approaches, mainline pavement sections with posted regulatory speeds less than 35 MPH, pavement within 15 ft of bridge decks and approach slabs not paved as part of the contract, pavement to a point 50 ft beyond the paving limits of the project, and all other surfaces not included in the Class I definition.			

* Each opportunity to improve the ride is one of the following: Placing a gravel or treated base course, OGSC, SMA, rotomilling, cold recycling, and each lift of paving. Leveling is not considered an opportunity to improve the ride.

Table 2 HMA	
Category	Incentive/Disincentive per Section
1	\$60 x [(Required in/mi) - (PI)]
2	\$30 x [(Required in/mi) - (PI)]

Table 3 OGSC & SMA	
Category	Incentive/Disincentive per Section
1	\$150 x [(Required in/mi) - (PI)]
2	\$100 x [(Required in/mi) - (PI)]

Table 4 PCCP	
Category	Incentive/Disincentive per Section
1	\$200 x [(Required in/mi) - (PI)]
2	\$125 x [(Required in/mi) - (PI)]

END OF SECTION

Standards Committee Submittal Sheet

Name of preparer: Karl Verhaeren

Title/Position of preparer: Engineer for Construction

Specification/Drawing/Item Title: Delete Section 02226 – Remove Concrete Slope Protection

Specification/Drawing Number: _____

Enter appropriate priority level:

(See last page for explanation) 3

Sheet not required on editorial or minor changes to standards. Check with Standards Section.

NOTES:

1. All Submittal Sheets must be completed and sent to the Standards and Specifications Section by the Standards Committee suspense date as shown on the Web.
(<http://www.udot.utah.gov/index.php/m=c/tid=303>)
2. The Preparer of the Submittal Sheet or the Standards Committee member (or authorized substitute) responsible for the submittal must be present at the Standards Committee meeting and capable of discussing and answering all questions related to the submittal. The item will be postponed to a later meeting if one of these people is not present.
3. Notify the Standards and Specifications Section immediately of any changes that impact the presentation to include absence of sponsor or delay in presentation.

Complete the following: (Use additional pages as needed.)

- A. Why? Detail the reason for changing the Standard (Specification or Drawing), what has initiated a new Standard, or what has caused a new or changed item of interest.

There is no need of having a separate section for 02226: Removal of Concrete Slope Protection when this is easily incorporated into Section 02221: Remove Structure and Obstruction.

- B. How is Measurement and Payment handled? Existing (from the measurement and payment document), modified, or new measurement and payment to be included with all Standard Specifications or Supplemental Specifications.

As follows:

Add the following:

(Section 02221: Remove Structure and Obstruction)

#	022210170	Remove Concrete Slope Protection	Square Yard
---	-----------	----------------------------------	-------------

Eliminate the following:

Section 02226: ~~Remove Concrete Slope Protection~~

#	022260010 Remove Concrete Slope Protection	Square Yard
---	---	----------------

C. Stakeholder Notification for AGC and ACEC:

By email provide the AGC and ACEC Standards Committee member a copy of all pertinent information relating to the specification or drawing. Detail all responses below. Indicate if no comments were received.

Note: There is a two-week response time set for this item.

Refer to the Standards Committee Web site, Members page at <http://www.udot.utah.gov/index.php/m=c/tid=659> for the respective e-mail addresses.

AGC Comments: (Use as much space as necessary.)

Sent to Norm Avery (WW Clyde) and Mont Wilson (Granite) on February 5, 2007 for review and comment.

Comments requested by March 1, 2007.

ACEC Comments: (Use as much space as necessary.)

Sent to ACEC on February 5, 2007 for review and comment.

Comments requested by March 1, 2007.

D. Stakeholders? From the list provided, document the stakeholders contacted, detailing: the company, name of contact, how contacted (by phone, email, hard copy, or in person), concerns, and comments of the change. Stakeholders:

Note: There is a two-week response time set for this item. Allow Stakeholders two weeks to process and respond to coordination requests. All areas should try to complete review and comment as soon as possible but within two weeks.

In-house (for example, preconstruction, materials, construction, safety, design, maintenance) (Include all applicable in-house areas even if not listed above.)

District Engineers

Sent to District Engineers and Resident Engineers on February 5, 2007 for review and comment.

Comments requested by March 1, 2007.

(Comments were received pointing out a typographical error and were in support of the proposed revisions.)

Contractors (Any additional contacts beyond "C" above.)

Suppliers

Consultants (as required) (Any additional contacts beyond “C” above.)

FHWA (To be accomplished as part of the two-week process before submitting to the Standards and Specifications Section for inclusion on the Standards Committee agenda.) (This is in addition to the requirements of UDOT Policy 08A5-1, procedure 08A5-1.3.)

Sent to FHWA February 5, 2007 for review and comment.

Comments requested by March 1, 2007.

Others (as appropriate)

Sent to all members of the Standards Committee for review and comment on February 5, 2007.

Comments requested by March 1, 2007.

Sent to Region Materials Engineers on February 5, 2007 for review and comment

Comments requested by March 1, 2007.

- E. Other impacted areas, systems, or personnel. (Consider all impacts and possible changes to these areas during the preparation process. Coordinate with all appropriate areas for the respective item. List all impacts and action taken.)

1. Minimum Sampling and Testing Guide (MS&T Requirements)
N/A
2. Business Systems (Electronic Bid System, Project Development Business System, Electronic Program Management, Computer-Aided Drafting and Design, etc.)
N/A
3. Implementation Plan (Provide detailed instructions on how the subject item will be implemented to include notification of all interested parties and training requirements.)
N/A

- F. Costs? (Estimates are acceptable.)

1. Additional costs to average bid item price.
N/A
2. Operational (For example, maintenance, materials, equipment, labor, administrative, programming).
N/A
3. Life cycle cost.
N/A

- G. Benefits? (Provide details that can be used to complete a Cost – Benefit Analysis.)
(Estimates are acceptable.) (If no costs, what is the benefit of making this change?)

No cost change. The benefit of the change is to reduce unnecessary sections within the Standard Specifications and place related material in a single location for ease of locating information.

- H. Safety Impacts?
N/A

- I. History? Address issues relating to the current usage of the item and past reviews, approvals, and/or disapprovals.
N/A

Priority Explanation

Enter the appropriate priority in the box on the first page of the document.

- | | |
|------------|---|
| Priority 1 | Upon posting, this impacts all projects in construction and design with a Change Order, Addenda, and immediate change to projects being advertised. |
| Priority 2 | Upon posting, this impacts projects being advertised. |
| Priority 3 | Upon posting, the approved standard takes effect four weeks later for projects being advertised. |

**Supplemental Specification
2005 Standard Specification Book**

SECTION 02226

REMOVE CONCRETE SLOPE PROTECTION

Delete Section 02226 in its entirety. Refer to Section 02221: Remove Structure and Obstruction.

Standards Committee Submittal Sheet

Name of preparer: Karl Verhaeren

Title/Position of preparer: Engineer for Construction

Specification/Drawing/Item Title: Delete Section 02749 – Asphalt Driveway

Specification/Drawing Number: _____

Enter appropriate priority level:

(See last page for explanation)

3

Sheet not required on editorial or minor changes to standards. Check with Standards Section.

NOTES:

1. All Submittal Sheets must be completed and sent to the Standards and Specifications Section by the Standards Committee suspense date as shown on the Web.
(<http://www.udot.utah.gov/index.php/m=c/tid=303>)
2. The Preparer of the Submittal Sheet or the Standards Committee member (or authorized substitute) responsible for the submittal must be present at the Standards Committee meeting and capable of discussing and answering all questions related to the submittal. The item will be postponed to a later meeting if one of these people is not present.
3. Notify the Standards and Specifications Section immediately of any changes that impact the presentation to include absence of sponsor or delay in presentation.

Complete the following: (Use additional pages as needed.)

- A. Why? Detail the reason for changing the Standard (Specification or Drawing), what has initiated a new Standard, or what has caused a new or changed item of interest.

There is no need of having a separate section for 02749: Asphalt Driveway. The section includes only references to other sections for information and appears to have been created for bid item purposes only. The bid item can be moved with other HMA items where it properly belongs.

- B. How is Measurement and Payment handled? Existing (from the measurement and payment document), modified, or new measurement and payment to be included with all Standard Specifications or Supplemental Specifications.

As follows:

Add the following:

Section 02741: Hot Mix Asphalt (HMA)

#	027410080	Asphalt Concrete Driveway	Each
Untreated Base Course (UTBC) and HMA are measured and paid for separately.			

Eliminate the following:

Section 02749: Asphalt Driveway

#	027490010	Asphalt Concrete Driveway	Each
Untreated Base Course (UTBC) and HMA are measured and paid for separately.			

C. Stakeholder Notification for AGC and ACEC:

By email provide the AGC and ACEC Standards Committee member a copy of all pertinent information relating to the specification or drawing. Detail all responses below. Indicate if no comments were received.

Note: There is a two-week response time set for this item.

Refer to the Standards Committee Web site, Members page at <http://www.udot.utah.gov/index.php/m=c/tid=659> for the respective e-mail addresses.

AGC Comments: (Use as much space as necessary.)

Sent to Norm Avery (WW Clyde) and Mont Wilson (Granite) on February 5, 2007 for review and comment.

Comments requested by March 1, 2007.

ACEC Comments: (Use as much space as necessary.)

Sent to ACEC on February 5, 2007 for review and comment.

Comments requested by March 1, 2007.

D. Stakeholders? From the list provided, document the stakeholders contacted, detailing: the company, name of contact, how contacted (by phone, email, hard copy, or in person), concerns, and comments of the change. Stakeholders:

Note: There is a two-week response time set for this item. Allow Stakeholders two weeks to process and respond to coordination requests. All areas should try to complete review and comment as soon as possible but within two weeks.

In-house (for example, preconstruction, materials, construction, safety, design, maintenance) (Include all applicable in-house areas even if not listed above.)

District Engineers

Sent to District Engineers and Resident Engineers on February 5, 2007 for review and comment.

Comments requested by March 1, 2007.

Contractors (Any additional contacts beyond "C" above.)

Suppliers

Consultants (as required) (Any additional contacts beyond “C” above.)

FHWA (To be accomplished as part of the two-week process before submitting to the Standards and Specifications Section for inclusion on the Standards Committee agenda.)
(This is in addition to the requirements of UDOT Policy 08A5-1, procedure 08A5-1.3.)

Sent to FHWA February 5, 2007 for review and comment.

Comments requested by March 1, 2007.

Others (as appropriate)

Sent to all members of the Standards Committee on February 5, 2007 for review and comment.

Comments requested by March 1, 2007.

Sent to Region Materials Engineers on February 5, 2007 for review and comment.

Comments requested by March 1, 2007.

E. Other impacted areas, systems, or personnel. (Consider all impacts and possible changes to these areas during the preparation process. Coordinate with all appropriate areas for the respective item. List all impacts and action taken.)

1. Minimum Sampling and Testing Guide (MS&T Requirements)

N/A

2. Business Systems (Electronic Bid System, Project Development Business System, Electronic Program Management, Computer-Aided Drafting and Design, etc.)

N/A

3. Implementation Plan (Provide detailed instructions on how the subject item will be implemented to include notification of all interested parties and training requirements.)

N/A

F. Costs? (Estimates are acceptable.)

1. Additional costs to average bid item price.

N/A

2. Operational (For example, maintenance, materials, equipment, labor, administrative, programming).

N/A

3. Life cycle cost.

N/A

- G. Benefits? (Provide details that can be used to complete a Cost – Benefit Analysis.)
(Estimates are acceptable.) (If no costs, what is the benefit of making this change?)

No cost change. The benefit of the change is to reduce unnecessary sections within the Standard Specifications.

- H. Safety Impacts?
N/A

- I. History? Address issues relating to the current usage of the item and past reviews, approvals, and/or disapprovals.
N/A

Priority Explanation

Enter the appropriate priority in the box on the first page of the document.

- | | |
|------------|---|
| Priority 1 | Upon posting, this impacts all projects in construction and design with a Change Order, Addenda, and immediate change to projects being advertised. |
| Priority 2 | Upon posting, this impacts projects being advertised. |
| Priority 3 | Upon posting, the approved standard takes effect four weeks later for projects being advertised. |

**Supplemental Specification
2005 Standard Specification Book**

SECTION 02749

ASPHALT DRIVEWAY

Delete Section 02749 in its entirety.

Standards Committee Submittal Sheet

Name of preparer: **Karl Verhaeren**

Title/Position of preparer: **Engineer for Construction**

Specification/Drawing/Item Title: *Delete the following Sections:*

02338: Refinish Subgrade

02715: Hydrated Lime Treated Roadbed

02762: Plowable Pavement Markers

02773: Asphalt Concrete Curb

02966: Recycled Surface

02967: Surface Repaving

Specification/Drawing Number: _____

Enter appropriate priority level:

(See last page for explanation)

4*

***Recommended change for 2008 Standards**

Sheet not required on editorial or minor changes to standards. Check with Standards Section.

NOTES:

1. All Submittal Sheets must be completed and sent to the Standards and Specifications Section by the Standards Committee suspense date as shown on the Web.
(<http://www.udot.utah.gov/index.php/m=c/tid=303>)
2. The Preparer of the Submittal Sheet or the Standards Committee member (or authorized substitute) responsible for the submittal must be present at the Standards Committee meeting and capable of discussing and answering all questions related to the submittal. The item will be postponed to a later meeting if one of these people is not present.
3. Notify the Standards and Specifications Section immediately of any changes that impact the presentation to include absence of sponsor or delay in presentation.

Complete the following: (Use additional pages as needed.)

- A. Why? Detail the reason for changing the Standard (Specification or Drawing), what has initiated a new Standard, or what has caused a new or changed item of interest.

The sections listed above should be deleted from the 2008 Standard Specifications. These sections are either obsolete or have been used so infrequently as to render them ineffective and outdated. Any future related work contemplated by the Department should be either handled through project special provision or re-submittal to Standards.

Note from Standards and Specifications: No Supplemental Specifications needed because the change impacts on the 2008 process. If approved the sections will be removed from the book and as well as any Related Section references in other active Sections.

- B. How is Measurement and Payment handled? Existing (from the measurement and payment document), modified, or new measurement and payment to be included with all Standard Specifications or Supplemental Specifications.

As follows:

Eliminate the following:

Section 02338: ~~Refinish Subgrade~~

#	023380010	Refinish Subgrade	Square Yard
---	----------------------	------------------------------	------------------------

Section 02715: ~~Hydrated Lime Treated Roadbed~~

#	027150010	Hydrated Lime Treated Roadbed	Square Yard
---	----------------------	--	------------------------

~~Average width of course multiplied by the length. Includes hydrated lime and asphaltic material used for membrane seal.~~

Section 02762: ~~Plowable Pavement Marker~~

#	027620010	Plowable Pavement Marker — One Way White	Each
---	----------------------	---	-----------------

#	027620020	Plowable Pavement Marker — One Way Yellow	Each
---	----------------------	--	-----------------

#	027620030	Plowable Pavement Marker — Two Way Yellow	Each
---	----------------------	--	-----------------

#	027620040	Plowable Pavement Marker	Each
---	----------------------	-------------------------------------	-----------------

Section 02773: ~~Asphalt Concrete Curb~~

#	027730010	Asphalt Concrete Curb	Feet
---	----------------------	----------------------------------	-----------------

Section 02966: ~~Recycled Surface~~

#	029660010	Recycled Surface	Square Yard
---	----------------------	-----------------------------	------------------------

#	029660020	Rejuvenating Agent	Ton
---	----------------------	-------------------------------	----------------

Section 02967: ~~Surface Repaving~~

#	029670010	Surface Repaving	Square Yard
---	----------------------	-----------------------------	------------------------

- ~~A. Measurement does not include overlap
B. Includes placing and compacting HMA~~

#	029670020	Rejuvenating Agent	Ton
---	----------------------	-------------------------------	----------------

C. Stakeholder Notification for AGC and ACEC:

By email provide the AGC and ACEC Standards Committee member a copy of all pertinent information relating to the specification or drawing. Detail all responses below. Indicate if no comments were received.

Note: There is a two-week response time set for this item.

Refer to the Standards Committee Web site, Members page at <http://www.udot.utah.gov/index.php/m=c/tid=659> for the respective e-mail addresses.

AGC Comments: (Use as much space as necessary.)

Sent to Norm Avery (WW Clyde) and Mont Wilson (Granite) on February 5, 2007 for review and comment.

Comments requested by March 1, 2007.

ACEC Comments: (Use as much space as necessary.)

Sent to ACEC on February 5, 2007 for review and comment.

Comments requested by March 1, 2007.

D. Stakeholders? From the list provided, document the stakeholders contacted, detailing: the company, name of contact, how contacted (by phone, email, hard copy, or in person), concerns, and comments of the change. Stakeholders:

Note: There is a two-week response time set for this item. Allow Stakeholders two weeks to process and respond to coordination requests. All areas should try to complete review and comment as soon as possible but within two weeks.

In-house (for example, preconstruction, materials, construction, safety, design, maintenance) (Include all applicable in-house areas even if not listed above.)

District Engineers

Sent to District Engineers and Resident Engineers on February 5, 2007 for review and comment.

Comments requested by March 1, 2007.

Contractors (Any additional contacts beyond "C" above.)

Suppliers

Consultants (as required) (Any additional contacts beyond "C" above.)

FHWA (To be accomplished as part of the two-week process before submitting to the Standards and Specifications Section for inclusion on the Standards Committee agenda.) (This is in addition to the requirements of UDOT Policy 08A5-1, procedure 08A5-1.3.)

Sent to FHWA February 5, 2007 for review and comment.

Comments requested by March 1. 2007.

Others (as appropriate)

Sent to all members of the Standards Committee for review and comment on February 5, 2007.

Comments requested by March 1. 2007.

Sent to Region Materials Engineers on February 5, 2007 for review and comment

Comments requested by March 1. 2007.

- E. Other impacted areas, systems, or personnel. (Consider all impacts and possible changes to these areas during the preparation process. Coordinate with all appropriate areas for the respective item. List all impacts and action taken.)

1. Minimum Sampling and Testing Guide (MS&T Requirements)
N/A
2. Business Systems (Electronic Bid System, Project Development Business System, Electronic Program Management, Computer-Aided Drafting and Design, etc.)
N/A
3. Implementation Plan (Provide detailed instructions on how the subject item will be implemented to include notification of all interested parties and training requirements.)
N/A

Note: These changes will require the elimination the reference to asphalt concrete curb on standard drawing BA 4E.

- F. Costs? (Estimates are acceptable.)

1. Additional costs to average bid item price.
N/A
2. Operational (For example, maintenance, materials, equipment, labor, administrative, programming).
N/A
3. Life cycle cost.
N/A

- G. Benefits? (Provide details that can be used to complete a Cost – Benefit Analysis.)
(Estimates are acceptable.) (If no costs, what is the benefit of making this change?)

No cost change. The benefit of the change is to reduce unnecessary sections within the Standard Specifications.

- H. Safety Impacts?
N/A

- I. History? Address issues relating to the current usage of the item and past reviews, approvals, and/or disapprovals.
N/A

Priority Explanation

Enter the appropriate priority in the box on the first page of the document.

- | | |
|------------|---|
| Priority 1 | Upon posting, this impacts all projects in construction and design with a Change Order, Addenda, and immediate change to projects being advertised. |
| Priority 2 | Upon posting, this impacts projects being advertised. |
| Priority 3 | Upon posting, the approved standard takes effect four weeks later for projects being advertised. |

Standards Committee Submittal Sheet

Name of preparer: Darin Sjoblom

Title/Position of preparer: Geotechnical Engineer

Specification/Drawing/Item Title: Driven Piles

Specification/Drawing Number: 02455

Enter appropriate priority level:

(See last page for explanation)

3

Sheet not required on editorial or minor changes to standards. Check with Standards Section.

NOTES:

1. All Submittal Sheets must be completed and sent to the Standards and Specifications Section by the Standards Committee suspense date as shown on the Web.
(<http://www.udot.utah.gov/index.php/m=c/tid=303>)
2. The Preparer of the Submittal Sheet or the Standards Committee member (or authorized substitute) responsible for the submittal must be present at the Standards Committee meeting and capable of discussing and answering all questions related to the submittal. The item will be postponed to a later meeting if one of these people is not present.
3. Notify the Standards and Specifications Section immediately of any changes that impact the presentation to include absence of sponsor or delay in presentation.

Complete the following: (Use additional pages as needed.)

- A. Why? Detail the reason for changing the Standard (Specification or Drawing), what has initiated a new Standard, or what has caused a new or changed item of interest.

This standard has needed a couple of minor changes and one significant change for some time. The most significant thing which has been added are price reductions for piles which are driven out of alignment or out of location. It is rarely possible to remove piles after being driven and piles that are out of alignment or location can adversely affect the foundation design and performance of a bridge. The price reduction table (which has been used in special provisions for approximately the last two years) will give the resident engineer the ability to pay a reduced price for a driven pile, without requiring the pile to be removed or replaced at no cost.

A second set of changes that had to be made were several references to CAPWAP analysis. This is proprietary software and there are other companies that provide the same service and made us aware of the need to change the language of our specification to make it non-proprietary.

There were also many things that were out of order or just worded poorly that needed minor changes.

This specification was reviewed by all UDOT Geotechnical Engineers as well as by the Structures Division 2008 spec review committee. All comments were addressed and incorporated into the revisions if approved by the committee.

NOTE from Standards and Specifications: We were advised by Darin that because so many things were moved around in 02455 only the changes made from comments received over the past few weeks were initially marked by Track Changes. Because of formatting problems and rewriting of several paragraphs in Parts 2 and 3 track changes are no longer shown for this document.

- B. How is Measurement and Payment handled? Existing (from the measurement and payment document), modified, or new measurement and payment to be included with all Standard Specifications or Supplemental Specifications.

Measurement and Payment sections should not be affected unless language needs to be added referring to the price reduction table that has been added to the spec. Please let me know if something needs to be changed.

- C. Stakeholder Notification for AGC and ACEC:

By email provide the AGC and ACEC Standards Committee member a copy of all pertinent information relating to the specification or drawing. Detail all responses below. Indicate if no comments were received.

Note: There is a two-week response time set for this item.

Refer to the Standards Committee Web site, Members page at <http://www.udot.utah.gov/index.php/m=c/tid=659> for the respective e-mail addresses.

AGC Comments: (Use as much space as necessary.)

Emailed revised specs to Mont Wilson. Called Mont and he said that AGC had no comments concerning the specification.

ACEC Comments: (Use as much space as necessary.)

Tyler Yorgason responded to email with no comments on 02455.

- D. Stakeholders? From the list provided, document the stakeholders contacted, detailing: the company, name of contact, how contacted (by phone, email, hard copy, or in person), concerns, and comments of the change. Stakeholders: **Over 70 potential stakeholders were emailed revised specs including FHWA, AGC, ACEC and UDOT Preconstruction Engineers, Construction/Maintenance Engineers (Central and Region), Materials Engineers (Central and Region), District Engineers, Project Managers and Resident Engineers.**

Note: There is a two-week response time set for this item. Allow Stakeholders two weeks to process and respond to coordination requests. All areas should try to complete review and comment as soon as possible but within two weeks.

In-house (for example, preconstruction, materials, construction, safety, design, maintenance) (Include all applicable in-house areas even if not listed above.)
Construction Engineers

Karl Verheran thoroughly reviewed the spec and provided several small editorial changes which were all accepted.

My response to his editorials were as follows:

Karl,

Thanks for reviewing the specs. You had some very good recommendations, all of which I have pretty much accepted (see attached revised documents). I clarified the language slightly in 02455 3.3.B.3, since you recommended deleting the end of the sentence. All other recommended changes in 02455 I accepted.

He also provided the following addition to Section 1.4: “B. Manufacturer’s product data, specifications, and recommended installation instructions”, which was added to the spec.

The following email was received concerning concrete sampling and testing frequencies:

Darin,

After further review and discussion there may a couple of things that still need to be considered related to the concrete sampling and testing for work included in the two sections. I've attached the latest files I received and highlighted the articles dealing with acceptance relative to concrete strength for the benefit of others copied on this message.

You are using the price adjustment information from 03055 which is probably fine - I would consider making the language as consistent as possible for both section articles in this regard.

You should be aware of the sampling and testing frequencies of concrete under Section 03055 and give some thought as to how it may relate to the application of strength test results to driven piles and drilled shafts. A set of three cylinders represents one test - for every 50 cubic yards, or fraction thereof. If this is sufficient for acceptance, then we're fine as it stands. On the other hand, if it is deemed that the frequency of sampling and testing of concrete for these items should be something different, then we will need to address this under the Department's MS&T section 03055.

These questions or issues can seem innocuous, but when assessing price adjustments on a percentage of the pile or drilled shaft bid price/ft for the low-strength concrete component it can become problematic if the frequency of sampling and testing somehow plays into these adjustments.

My email response to the sampling and testing questions:

Karl,

We discussed this internally and ran it through Boyd and don't think it's a big issue. If there were any way that this could help us to improve the quality of the concrete (if there is a problem) while we're actually constructing the drilled shafts or filling the piles, we would probably tighten up the frequency of testing, but since we find out after the fact and it's just used as a penalty, the current frequency is probably adequate. If you disagree, please let me know. Otherwise, let's just leave the frequency as is.

Karl's response:

I'm okay with leaving it as is. Just wanted to make sure we gave it some thought.

We elected to leave the sampling and testing frequency as currently written in the specs.

Clark Mackey (R-4) commented on concrete class in the following:

Driven piles Section 2.3 Change 'Class A' to 'Class A(AE)' Section 03055 does not have any information for 'C'

Class A was changed to Class A(AE) in Section 2.3.

Contractors (Any additional contacts beyond "C" above.)

None other than listed in C.

Suppliers

None

Consultants (as required) (Any additional contacts beyond "C" above.)

None

FHWA (To be accomplished as part of the two-week process before submitting to the Standards and Specifications Section for inclusion on the Standards Committee agenda.) (This is in addition to the requirements of UDOT Policy 08A5-1, procedure 08A5-1.3.)

FHWA (Anthony Sarhan, Russ Robertson with consultation from Barry Siel in the Region Office) reviewed the spec and provided the following comments concerning reinforcement placement in conjunction with concrete placement. First, from the local office:

Spec 02455 section 3.4 L (page 6 of 9) – could you please provide some supporting documentation for placing the rebar cage after placing and vibrating the concrete. We have reviewed this in our office and spoken with the Resource Center in Lakewood and question the origin of this point.

Then comments forwarded from Barry Siel:

Anthony,

I have reviewed the subject specifications and have the following comments:

Driven Piles:

- 1) 2.5.A and B. are tied 1.4. Submittals. 1.4 A should be referenced, as it is in 2.5.C. Maybe add some verbal such as ... in accordance with 1.4.A.
- 2) This is a typo, in 3.2.D, the last sentence should end, "...foundations have been established." since criteria is plural.
- 3) 3.3.B.4 references AWS D.1.1. This should be AWS D.1.5 which is the section created jointly by AASHTO and AWS to address discrepancies between the two organization's welding specifications.
- 4) 3.4.L calls for the cage to be placed in pipe piles after the concrete is poured. This is not only difficult by could damage the cage if the contractor has to force the cage down into the concrete. The following would be preferred.

Place the reinforcement cage into the driven pipe pile when the concrete reaches the planned bottom elevation of the reinforcement. Support the reinforcement so it remains within 2 inches of the required vertical location. Support the cage from the top until the concrete reaches the top of the pile.

Comments 1 and 3 from Barry Siel were incorporated as requested. According to Comment 2, in 3.2.D "has" was changed to "have" since "criteria" is plural. However, "foundation" was not changed to "foundations" since we are talking about a single foundation that this applies to. Using "foundations" would be confusing to the contractor. He would probably think that the criteria applied to all other foundations on the bridge, and this is not true. PDA analysis has to be performed on each foundation, not just on the first one tested.

To address the concerns expressed by the local office and by Barry Siel in Comment 4, 02455 3.4.L was deleted and 3.4.M (now L) was changed to, "If rebar cage is placed in concrete after it is poured, vibrate concrete once again after inserting cage to eliminate voids around the cage." Barry Siel's addition in Comment 4 was added as 3.4.M in the following manner, "For piles larger than 16 inches in diameter, place the reinforcement cage into the driven pipe pile when the concrete reaches the planned bottom elevation of the reinforcement. Support the reinforcement so it remains within 2 inches of the required vertical location. Support the cage from the top until the concrete reaches the top of the pile." After internal discussions with the Structures Division, it was decided that it is nearly impossible to follow the procedure FHWA has recommended for piles 16 inches or smaller. The cages are too small in diameter to fit a pump thorough. It is possible on larger diameter piles however, and a good idea to do, and therefore incorporated into the spec.

Others (as appropriate)

Jim Higbee of the Geotech Division expressed some concerns in the language concerning pile alignment and location in Section 3.3.C. The spec spoke of measuring alignment at ground surface but did said nothing about pile bending below grade, which is sometimes a problem. The language in this section was changed to read as follows:

- C. Keep driven piles within 6 inches of the designated plan location, and within 2.0 percent of vertical (plumb) throughout the total length of the pile (including bending). This is roughly equivalent to ¼ inch in a foot, or 0.60 inches in 30 inches.
 - 1. Verify that these criteria have been met, including using a calibrated pile bending probe where necessary, at the end of pile driving before proceeding with backfilling or other associated foundation work.

The language in Section 3.3.D was changed to match the changes in 3.3.C as follows:

- D. Drive additional piles as required to replace damaged piles and piles driven out of plumb, or plan location at locations designated by the Engineer.

The language in Section 3.5.B.1 and Table 1 was also clarified to match the changes to Section 3.3.C.

E. Other impacted areas, systems, or personnel. (Consider all impacts and possible changes to these areas during the preparation process. Coordinate with all appropriate areas for the respective item. List all impacts and action taken.)

- 1. Minimum Sampling and Testing Guide (MS&T Guide)

No impacts.

- 2. Business Systems (Electronic Bid System, Project Development Business System, Electronic Program Management, Computer-Aided Drafting and Design, etc.)

No impacts.

- 3. Implementation Plan (Provide detailed instructions on how the subject item will be implemented to include notification of all interested parties and training requirements.)

Implementation already in place (as a special provision). No training required.

F. Costs? (Estimates are acceptable.)

1. Additional costs to average bid item price.

No anticipated impacts.

2. Operational (For example, maintenance, materials, equipment, labor, administrative, programming).

No anticipated impacts.

3. Life cycle cost.

No anticipated impacts.

G. Benefits? (Provide details that can be used to complete a Cost – Benefit Analysis.) (Estimates are acceptable.) (If no costs, what is the benefit of making this change?)

The language and order of the spec have been greatly improved. The price reduction pay factors for non-conforming pile driving tolerances will be an important tool in improving the quality of our driven pile foundations and in being able to fairly compensate contractors without having to remove and re-drive piles that aren't to severely out of alignment. The pay factor reductions have been used on several projects as a special provision and we feel that the quality of pile driving has improved on these jobs.

H. Safety Impacts?

None

I. History? Address issues relating to the current usage of the item and past reviews, approvals, and/or disapprovals.

This spec has been used successfully as a special provision in its current form (or very close to it) for the past couple of years.

Priority Explanation

Enter the appropriate priority in the box on the first page of the document.

Priority 1 Upon posting, this impacts all projects in construction and design with a Change Order, Addenda, and immediate change to projects being advertised.

Priority 2 Upon posting, this impacts projects being advertised.

Priority 3 Upon posting, the approved standard takes effect **four weeks** later for projects being advertised.

**Supplemental Specification
2005 Standard Specification Book**

Section 02455

DRIVEN PILES

Delete Section 02455 and replace with the following:

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Materials, equipment and procedures for driving steel piles.

1.2 RELATED SECTIONS

- A. Section 03055: Portland Cement Concrete.
- B. Section 03211: Reinforcing Steel and Welded Wire.

1.3 REFERENCES

- A. AASHTO M 31: Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
- B. AASHTO M 270: Structural Steel for Bridges
- C. ASTM A 252: Welded and Seamless Steel Pipe Piles
- D. ASTM D 4945: High Strain Dynamic Testing of Piles
- E. AASHTO/AWS Welding Specifications

1.4 SUBMITTALS

- A. Complete and submit the “Pile and Driving Equipment Data” form located at the end of this Section for each proposed hammer and pile/structure combination.
 - 1. Provide all data in the form necessary to perform a pile driving wave equation analysis, together with preliminary schedule for driving.

2. Within 14 calendar days of submitting the form, the Engineer will provide either:
 - a. Approval to continue
 - b. Notification of inadequate equipment
- B. Manufacturer's product data, specifications, and recommended installation instructions

PART 2 PRODUCTS

2.1 PIPE PILE SHELLS

- A. Use new pipe pile shells having wall thickness as shown on plans.
- B. Meet requirements for ASTM A 252 steel, for either Grade 2 (normal strength) or Grade 3 (high strength) steel, or for other minimum yield stress value(s) shown on the plans.

2.2 STEEL HP SECTION PILES

- A. Follow AASHTO M 270 for Grade 36 or 50 steel, as specified in the plans.

2.3 PORTLAND CEMENT CONCRETE

- A. Class A(AE) Concrete following Section 03055.

2.4 REINFORCING STEEL

- A. Meet AASHTO M 31, Grade 60.
- B. Refer to Section 03211.

2.5 PILE DRIVER

- A. Verify the equipment can drive piles to the required ultimate driving resistance without damage or without requiring an excessive number of blows to achieve the required tip elevation and capacity before mobilizing pile driver to the site, in accordance with this Section, article 1.4, paragraph A.
- B. Mobilize pile driver to the site only after the Engineer indicates that acceptable results of the wave equation analysis have been obtained in accordance with this Section, article 1.4, paragraph A.

- C. Remove any mobilized pile driver and related equipment found to be inadequate for the project pile driving conditions, and repeat the requirements of this Section, article 1.4, paragraph A until an acceptable pile driver system is obtained.
 - 1. Re-mobilize the accepted hammer at no cost to the Department.
- D. Provide accurate test information regarding the yield stress values (heat) for each batch of piles to be used on the project.
- E. Equip pile driver following Manufacturer's recommendations.
- F. Leads:
 - 1. Used with all types of hammers.
 - 2. Hold in the required position with guys, stiff braces, or both.
 - 3. Hold the pile parallel to the leads.
 - 4. Accommodate the maximum length of the pile segment, and extend to the lowest point that the hammer must reach.
 - 5. Obtain approval from the Engineer before using followers.
- G. Drive Cap (or Drive Head): Fits the top of pile and provides full bearing. For pipe piles, drive cap to have a machined surface to fully engage the end of the pipe.
- H. Hammer:
 - 1. With fully operable adjustable settings.
 - 2. Rated energy greater than or equal to the value indicated on the foundation plans.
 - 3. Inspect hammer cushion with the Engineer present before beginning pile driving and after every 100 hours of pile driving. Replace the cushion when it loses 25 percent or more of its original thickness.

PART 3 EXECUTION

3.1 PREPARATION

- A. Complete all foundation excavation before driving piles.
- B. Dewater excavation at least 1 ft below bottom of foundation at all times during pile driving.
- C. Notify the Engineer of any conflicts between the designated position of piles and the locations of existing piles from previous construction, existing utilities, old foundations, or other potential conflicts. The Department designates new pile locations as required.

3.2 DYNAMIC ANALYSIS OF PILE DRIVING

- A. Notify the Engineer at least five working days before pile driving is to begin on the project, and at least five working days before piles are to be driven on all subsequent abutment and bent foundations.
- B. The Department (or a Department authorized geotechnical firm) conducts at least one high strain dynamic test (in accordance with ASTM D 4945) per foundation (abutment, bent, or pier foundation). The Department performs this test using pile driving analysis (PDA) equipment on the driving of the first pile at each abutment and bent/pier foundation.
- C. Cooperate with the Department in conducting PDA including, but not limited to, the following:
 - 1. Provide adequate space and conditions for the PDA rig and equipment.
 - 2. Climb the driver leads as necessary to attach, check and remove PDA gages; or provide a platform at least 4-feet square with a 4-foot high safety rail, equipped to be raised to the top of the pile located in the leads, to allow personnel to safely attach and remove gages.
 - 3. Begin installation of dynamic analysis gages after placing the pile in the leads. Allow approximately one hour per pile for installation of dynamic measuring equipment. Allow one additional hour for installation of measuring equipment after splicing, if splicing is performed and additional testing is required.
 - 4. Reduce the energy of the hammer or make other adjustments as necessary, if the stress exceeds the specified limit during the test.
 - 5. Drive the pile until the test indicates the required driving resistance shown on the plans is achieved, unless otherwise indicated by the Department.
- D. The Department evaluates the driving resistance, and establishes driving criteria, using a wave equation analysis program with signal matching.
 - 1. Do not drive other piles in the foundation until the Department gives notice that the test results indicate that sufficient capacity has been obtained, and the driving criteria for the remainder of the piles in the foundation has been established.
- E. Perform a restrrike PDA test on the pile after a sufficient time period (generally 24 or more hours after the initial driving of the pile) if sufficient capacity is not obtained.
 - 1. Do not perform restrikes using a cold hammer.

- F. Notify the Engineer if any of the remaining piles in the foundation do not meet the established driving criteria before moving hammer away from bent/abutment area, or if driving conditions otherwise change.
 - 1. The Department may require testing additional piles and reestablishing driving criteria for the remaining piles within the foundation.

3.3 PILE INSTALLATION

- A. Pre-drill/pre-auger if the designated pile tip elevation cannot be reached by the approved pile driver.
 - 1. Do not drill holes greater in diameter than the diameter or other maximum dimension of the pile.
- B. Pile Splicing:
 - 1. Use no more than one spliced section less than 6 ft, and splice no other section less than 30 ft for any pile.
 - 2. Inspect the driven pile section before splicing any pile section to determine if it has been distorted from its original shape, or otherwise damaged from pile driving operations.
 - a. Remove the damaged portion where distortion/damage has occurred, before splicing the next segment.
 - 3. Splice new pile segments parallel with previously driven pile segments.
 - 4. Butt weld the entire pile cross section using full penetration welds as per AASHTO/AWS D.1.1 for pipe piles and AASHTO/AWS D.1.5 for HP section piles.
- C. Keep driven piles within 6 inches of the designated plan location, and within 2.0 percent of vertical (plumb) throughout the total length of the pile (including bending). This is roughly equivalent to ¼ inch in a foot, or 0.60 inches in 30 inches.
 - 1. Verify that these criteria have been met, including using a calibrated pile bending probe where necessary, at the end of pile driving before proceeding with backfilling or other associated foundation work.
 - 2. Notify the Department to determine the appropriate resolution if either requirement is not met.
 - 3. Contractor bears all costs for any measures required to resolve the non-conformance including the pay reduction factors shown in Table 1 in this Section, article 3.5.
- D. Drive additional piles as required to replace damaged piles and piles driven out of plumb, or plan location at locations designated by the Engineer.
- E. Drive down piles that were raised due to driving adjacent piles.

- F. Notify the Department of water collecting in open pipe piles so that they can be evaluated for possible damage.
 - 1. Drive additional piles as described above and abandon damaged piles as directed by the Department as necessary to resolve concerns with pile damage indicated in this Section, article 3.3, paragraph F.
- G. Cover open-ended pipe piles to prevent the collection of precipitation, other sources of water, or debris.
- H. Cutting and Capping Piles:
 - 1. Remove all damaged material from the top of the piles.
 - 2. Keep sides of piles at least 9 inches away from nearest edge of pile cap.
 - 3. Cut off piles with clean, straight-line cuts to the designated elevation at a right angle to the pile axis.
 - 4. Level all irregularities before placing concrete for pile cap.
- I. Fill any annular space between the pipe shell and the surrounding soil with grout or clean sand washed down to reestablish lateral support.
- J. Remove all loose and displaced materials from around the completed piles leaving clean, solid surfaces to receive the concrete.
- K. Level all irregularities before constructing pile cap.

3.4 CONCRETE FILLING OF CLOSED-END PIPE PILES

- A. Remove water and debris from pipe piles before filling with concrete.
- B. Receive approval from the Engineer before concrete placement in pipe piles.
- C. Fill pipe piles with specified concrete after compliance with all tolerances and required criteria have been confirmed by the Engineer.
- D. Avoid segregation of the concrete ingredients.
- E. Slump at the time of placement: between 4 and 6 inches.
- F. Arrange chutes, pipes, etc. used as aids in placing concrete so concrete does not separate (i.e. flows freely without having to be pushed or shoveled).
- G. Place concrete in pipe shell either by free fall, or through a tremie, drop chute, or concrete pump.
- H. Place concrete to the base without contacting either the rebar cage or the pipe wall.

- I. Discharge concrete into a funnel-type downpipe centered over the hopper or bucket if a hopper or concrete bucket is used.
 - 1. Do not discharge concrete directly from the mixer into the hopper or bucket.
- J. Use high frequency internal vibrators to consolidate concrete to at least 3 ft below the bottom of the rebar cage, or to at least 13 ft below the pile cutoff level, whichever is deeper.
- K. Do not vibrate concrete that has taken initial set.
- L. Vibrate concrete again after inserting cage to eliminate voids around the cage if rebar cage is inserted after concrete has been placed.
- M. Place the reinforcement cage into the driven pipe pile when the concrete reaches the planned bottom elevation of the reinforcement for piles larger than 16 inches in diameter.
 - 1. Support the reinforcement so it remains within 2 inches of the required vertical location.
 - 2. Support the cage from the top until the concrete reaches the top of the pile.
- N. Secure rebar cage in position until concrete is set.
- O. Provide lighting to the work site if concrete placement is to occur after daylight hours so all operations are plainly visible.
- P. Embed the tops of piles in the concrete pile cap as shown on the plans.

3.5 PRICE REDUCTIONS FOR NON-CONFORMING WORK

- A. Price Adjustment - Reduction for Deficient Strength Concrete:
 - 1. Consider acceptance for concrete in pipe pile shells that are below the specified strength according to this Section.
 - 2. The Department will:
 - a. Use Contractor's unit bid price and the pay factors schedule presented in Section 03055 to calculate the price reduction for compensation.
 - b. Evaluate for payment all concrete with a compressive strength deviation of over 400 psi below the specification, to determine capability of the material to maintain the integrity of the concrete-filled pipe pile.
 - c. Provide acceptance for:
 - 1) A 50 percent pay factor or

- 2) Direct another pile driven at a suitable location adjacent to the deficient pile.

B. Price Adjustment - Reduction for Out-of-Tolerance Piles:

1. Demonstrate technical adequacy for piles driven out of plumb or plan location.
2. The Department will:
 - a. Accept piles according to this Section, article 3.5.
 - b. Reject any pile driven outside the upper deviation limits shown in Table 1 below.
 - 1) No payment made for the rejected pile.
 - c. Use the Contractor's unit bid price and the pay factors schedule presented in Table 1 to calculate the price reduction for compensation.

Table 1

PRICE REDUCTION PAY FACTORS FOR NON-CONFORMING PILE DRIVING TOLERANCES		
Pay Factor	Plumb, % (deviation from 2.0 %)	Plan Location, in. (deviation from 6 in.)
1.00	0.00 to 0.40	0.00 to 0.75
0.90	0.41 to 0.80	0.76 to 1.50
0.80	0.81 to 1.20	1.51 to 2.25
0.70	1.21 to 1.60	2.26 to 3.00
0.50	1.61 to 2.00	3.01 to 3.75
0.30	2.01 to 2.40	3.76 to 4.50
0.10	2.41 to 3.00	4.51 to 6.00
0.0, Reject	> 3.00	> 6.00

C. The Department will:

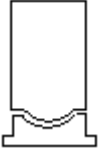
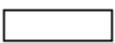
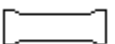
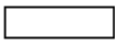

1. Apply pay factors to each pile individually based on the total measured pile length from the specified cutoff elevation.
2. Apply only the most critical of the two criteria (i.e. having the lowest pay factor) for any one pile.

END OF SECTION

The recommended "Pile and Driving Equipment Data" form follows.

Pile and Driving Equipment Data

Project No: _____
 Project Name: _____ County: _____
 Drawing No: _____
 General Contractor: _____
 Pile Driving Contractor/Subcontractor: _____
 Phone: _____ FAX: _____
 (Piles driven by, foreman): _____
 Date Submitted: _____

Hammer Components		Hammer	Manufacturer: _____ Model: _____ Type: _____ Serial No: _____ Manufacturer's Maximum Rated Energy: _____ (k-ft) Stroke at Maximum Rated Energy: _____ (ft) Range in Operating Energy: _____ to _____ (ft-k) Range in Operating Stroke: _____ to _____ (ft) Modifications: _____																				
		Ram	Ram Weight: _____ (lbs) Ram Length: _____ (ft) (for diesel hammers)																				
		Anvil	Ram Cross Sectional Area: _____ (in ²) (With diesel hammers) Anvil Weight: _____ (lbs)																				
		Hammer Cushion	<table border="0"> <tr> <td></td> <td style="text-align: center;">Material #1</td> <td style="text-align: center;">Material #2</td> </tr> <tr> <td>Name:</td> <td>_____</td> <td>_____</td> </tr> <tr> <td>Area:</td> <td>_____</td> <td>_____ (in²)</td> </tr> <tr> <td>No. of Plates:</td> <td>_____</td> <td>_____</td> </tr> <tr> <td>Thickness:</td> <td>_____</td> <td>_____ (in)</td> </tr> <tr> <td>Mod. of Elasticity - E:</td> <td>_____</td> <td>_____ (psi)</td> </tr> <tr> <td>Coeff. of Restitution - e:</td> <td>_____</td> <td>_____</td> </tr> </table>		Material #1	Material #2	Name:	_____	_____	Area:	_____	_____ (in ²)	No. of Plates:	_____	_____	Thickness:	_____	_____ (in)	Mod. of Elasticity - E:	_____	_____ (psi)	Coeff. of Restitution - e:	_____
	Material #1	Material #2																					
Name:	_____	_____																					
Area:	_____	_____ (in ²)																					
No. of Plates:	_____	_____																					
Thickness:	_____	_____ (in)																					
Mod. of Elasticity - E:	_____	_____ (psi)																					
Coeff. of Restitution - e:	_____	_____																					
	Drive Cap	Helmet Weight: _____ (lbs) Bonnet Anvil Block Drive Head																					
Pile		Pile Cushion (Only for Concrete or Timber Piles)	Material: _____ Area: _____ (in ²) No. of Sheets: _____ Thickness/Sheet: _____ (in) Total Thickness of Pile Cushion: _____ (in) Mod. of Elasticity - E: _____ (psi) Coeff. of Restitution - e: _____																				
		Pile	Diameter: _____ (in) Wall Thickness: _____ (in) Taper (if any): _____ Length in Leads: _____ (ft) Ordered Length: _____ (ft) Required Driving Resistance: _____ (kips) Description of Splice: _____ Tip Treatment/Plate Description: _____																				

Use Separate Data Sheet for Each Proposed Hammer and Pile/Structure Combination

Standards Committee Submittal Sheet

Name of preparer: Darin Sjoblom

Title/Position of preparer: Geotechnical Engineer

Specification/Drawing/Item Title: Drilled Caisson (to be changed to Drilled Shafts)

Specification/Drawing Number: 02466

Enter appropriate priority level:

(See last page for explanation)

3

Sheet not required on editorial or minor changes to standards. Check with Standards Section.

NOTES:

1. All Submittal Sheets must be completed and sent to the Standards and Specifications Section by the Standards Committee suspense date as shown on the Web.
(<http://www.udot.utah.gov/index.php/m=c/tid=303>)
2. The Preparer of the Submittal Sheet or the Standards Committee member (or authorized substitute) responsible for the submittal must be present at the Standards Committee meeting and capable of discussing and answering all questions related to the submittal. The item will be postponed to a later meeting if one of these people is not present.
3. Notify the Standards and Specifications Section immediately of any changes that impact the presentation to include absence of sponsor or delay in presentation.

Complete the following: (Use additional pages as needed.)

- A. Why? Detail the reason for changing the Standard (Specification or Drawing), what has initiated a new Standard, or what has caused a new or changed item of interest.

For years the title of Section 02466, "Drilled Caisson" has been referred to in the industry as "Drilled Shafts." This is a good time to change it to the correct title.

There were also some other fairly minor changes that have been brought up in the Structures Division review process and by individuals that this spec was sent to several weeks ago in preparation for the Standard's Committee meeting at the end of this month.

This specification was reviewed by all UDOT Geotechnical Engineers as well as by the Structures Division 2008 spec review committee. All comments were addressed and incorporated into the revisions if approved by the committee. Several other items have also been incorporated based on comments received over the past few weeks. The attached spec shows all tracked changes that have been made from the 2005 version.

- B. How is Measurement and Payment handled? Existing (from the measurement and payment document), modified, or new measurement and payment to be included with all Standard Specifications or Supplemental Specifications.

Measurement and Payment sections should not be affected other than the title change to the spec.

- C. Stakeholder Notification for AGC and ACEC:

By email provide the AGC and ACEC Standards Committee member a copy of all pertinent information relating to the specification or drawing. Detail all responses below. Indicate if no comments were received.

Note: There is a two-week response time set for this item.

Refer to the Standards Committee Web site, Members page at <http://www.udot.utah.gov/index.php/m=c/tid=659> for the respective e-mail addresses.

AGC Comments: (Use as much space as necessary.)

Emailed revised specs to Mont Wilson. Called Mont and he said that AGC had no comments concerning the specification.

ACEC Comments: (Use as much space as necessary.)

Tyler Yorgason responded to email with very minor formatting comments to spec, which are now incorporated.

- D. Stakeholders? From the list provided, document the stakeholders contacted, detailing: the company, name of contact, how contacted (by phone, email, hard copy, or in person), concerns, and comments of the change. Stakeholders: **Over 70 potential stakeholders were emailed revised specs including FHWA, AGC, ACEC and UDOT Preconstruction Engineers, Construction/Maintenance Engineers (Central and Region), Materials Engineers (Central and Region), District Engineers, Project Managers and Resident Engineers.**

Note: There is a two-week response time set for this item. Allow Stakeholders two weeks to process and respond to coordination requests. All areas should try to complete review and comment as soon as possible but within two weeks.

In-house (for example, preconstruction, materials, construction, safety, design, maintenance) (Include all applicable in-house areas even if not listed above.)

Construction Engineers

Karl Verheran thoroughly reviewed the spec and provided several small editorial changes which were all accepted.

Karl's first email concerning this spec was as follows:

The attached files show some suggested revisions (minor) and comments/questions - tracked.

I'm not sure how important the change in terms from "caisson" to "shaft" is, but it should be noted that "caisson" is used the following number of times in the following specifications:

03310 (Standard) - 1
02892 (Supplemental) - 2
013552 (Standard) - 3
013552M (Supplemental) - 3
013556 (Supplemental) - 3
013557 (Standard) - 2

If we proceed with this change, the designation will also have to be changed in the bid system and M&P document to match the new section title.

My response was as follows:

Karl,

Thanks for reviewing the specs. You had some very good recommendations, all of which I have pretty much accepted (see attached revised documents).

In 02466 1.4.A.2, I changed "volume" to "the measurement". I hope this wording works better. Please let me know. In 3.5.B I didn't add anything. I realize that pump trucks must be prequalified through UDOT QMP, but I assume this requirement is stated elsewhere, and since we don't state any other prequalifications like this in our geotech specs, I assume we don't need to state it here. Please let me know if this is all right. All other editorial comments I accepted.

Due to the terminology used by FHWA and the rest of the industry, the name change from "Drilled Caisson" to "Drilled Shafts" is something that we have wanted (and needed) to do for years. I have been through the other specs and supplementals that you mentioned and it appears that a simple word change from "caisson" to "drilled shaft(s)" or "shaft(s)" will be adequate. Thanks for looking these up. They should all be changed along with any conflicting language in the bid system and M&P. I will provide Barry with what I feel is the best word(s) to use in each of these specs in a separate email. I assume the bid system and M&P will be changed by the Standards group? Please let me know if this is not the case.

Hopefully this has addresses all of your comments. Thanks for your help!

Darin

Karl responded to my email and comments as follows:

Darin,

Everything appears fine... You can delete my comments from the document. I mentioned the pump truck prequalification because most people are unaware of this requirement - probably for good reason, as it is somewhat unclear as to where this requirement is stated - but I wouldn't suggest adding any language to the specification in this regard.

I believe the Standards submittal form asks for possible changes to the M&P document - you could cut and paste the attached into the submittal form - the changes to the bid system would follow from there.

Hope this is/was helpful. Thanks for your efforts on these sections.

I provided the following email to Barry Axelrod to assist him in changing the "caisson" terminology to "drilled shaft" terminology in the specs mentioned by Karl:

Barry,

I went through each of the standard and supplemental specs mentioned by Karl and checked the usage of "caisson(s)" or "drilled caisson(s)" in each instance and it appears a simple replacement with "drilled shaft(s)" or just "shaft(s)" will be sufficient. To help you in changing each of these specs for the 2008 spec book, I will provide the exact reference and what I feel is the best wording replacement in each instance. You can save this for the time when you are working on making these kinds of changes for the 2008 book. I realize that if 02466 becomes a Supplemental Specification before 2008, these minor changes in the other effected specs will not be made until the 2008 book.

003310 (Standard) - 3.1.A.2.C - Substitute "drilled shafts" for "caissons"

02892 (Supplemental) - 1.2.A - Substitute "Shafts" for "Caisson"; 3.2.F - Substitute "Shafts" for "Caisson"

013552 (Standard) - 3.2.G - Substitute "Drilled Shafts" for "Caissons" in first sentence. Substitute "Shafts" for "Caissons" in second sentence; 3.2.G.2 - Substitute "shaft" for "caisson"

013552M (Supplemental) - 3.2.E - Substitute "drilled shafts" for "caissons"; 3.2.E.1 - Substitute "shafts" for "caissons"; 3.2.E.2 - Substitute "shaft" for "caisson"

013556 (Supplemental) - 3.2.D - Substitute "drilled shafts" for "Caissons" in first sentence. Substitute "shafts" for "caissons" in second sentence; 3.2.D.2 - Substitute "shaft" for "caisson"

013557 (Standard) - 1.2.B - Substitute "Drilled Shafts" for "Drilled Caisson"; 3.3.C.2 - Substitute "shaft" for "caisson"

The following email was received concerning concrete sampling and testing frequencies:

Darin,

After further review and discussion there may a couple of things that still need to be considered related to the concrete sampling and testing for work included in the two sections. I've attached the latest files I received and highlighted the articles dealing with acceptance relative to concrete strength for the benefit of others copied on this message.

You are using the price adjustment information from 03055 which is probably fine - I would consider making the language as consistent as possible for both section articles in this regard.

You should be aware of the sampling and testing frequencies of concrete under Section 03055 and give some thought as to how it may relate to the application of strength test results to driven piles and drilled shafts. A set of three cylinders represents one test - for every 50 cubic yards, or fraction thereof. If this is sufficient for acceptance, then we're fine as it stands. On the other hand, if it is deemed that the frequency of sampling and testing of concrete for these items should be something different, then we will need to address this under the Department's MS&T section 03055.

These questions or issues can seem innocuous, but when assessing price adjustments on a percentage of the pile or drilled shaft bid price/ft for the low-strength concrete component it can become problematic if the frequency of sampling and testing somehow plays into these adjustments.

My email response to the sampling and testing questions:

Karl,

We discussed this internally and ran it through Boyd and don't think it's a big issue. If there were any way that this could help us to improve the quality of the concrete (if there is a problem) while we're actually constructing the drilled shafts or filling the piles, we would probably tighten up the frequency of testing, but since we find out after the fact and it's just used as a penalty, the current frequency is probably adequate. If you disagree, please let me know. Otherwise, let's just leave the frequency as is.

Karl's response:

I'm okay with leaving it as is. Just wanted to make sure we gave it some thought.

We elected to leave the sampling and testing frequency as currently written in the specs.

Karl pointed the following out in a later email:

It was pointed out to me that there was no "Submittal" article under 02466.

Carl's submittal language was added as follows:

1.5 SUBMITTALS

- A. Submit procedure to Engineer to place concrete under water.

Clark Mackey (R-4) commented on concrete class in the following:

I offer the following comments on your two specifications

Driven piles Section 2.3 Change 'Class A' to 'Class A(AE)' Section 03055 does not have any information for 'Class A'.

Drilled shafts Section 2.1 Same comment as above. Section 3.1.A.4. Is there a better way to define adjacent? Could you define a distance between drilled shafts that would be acceptable. I could see this as limiting the drilling of shafts in an abutment or bent footing as requiring 48 hours between each drilled shaft. The next one drilled will always be adjacent to the previous one. Section 3.5.G change the word 'pour' to 'placement'.

Class A was changed to Class A(AE) in Section 2.1. See responses to FHWA comments below in addressing Section 3.1.A.4. In section 3.5.G, 'pour' was changed to 'placement' as requested.

Contractors (Any additional contacts beyond "C" above.)

None other than listed in C.

Suppliers

None

Consultants (as required) (Any additional contacts beyond "C" above.)

None

FHWA (To be accomplished as part of the two-week process before submitting to the Standards and Specifications Section for inclusion on the Standards Committee agenda.) (This is in addition to the requirements of UDOT Policy 08A5-1, procedure 08A5-1.3.)

FHWA (Anthony Sarhan, Russ Robertson with consultation from Barry Siel in the Region Office) reviewed the spec and provided the following comments concerning reinforcement placement in conjunction with concrete placement. First, from the local office:

Spec 02466 section 3.1.A.4 – we have some questions on how this requirement potentially impacts constructability. FHWA suggests that the requirement be more in line with the guidance provided in

FHWA publication FHWA-IF-99-025 "Drilled Shafts: Construction Procedures and Design Methods". Attached is an excerpt from chapter 8 regarding drilling near recently concreted shafts which recommends disallowing the driving of piles or casing, or drilling of new shafts closer than two shaft diameters clear spacing to the shaft with newly set concrete.

Then comments forwarded from Barry Siel:

Anthony,

I have reviewed the subject specifications and have the following comments:

Drilled Shafts:

- 1) 3.1.A.4 should be more specific as to what constitutes an adjacent shaft. I suggest that this spec apply to shafts within the greater of 15 feet or 3 shaft diameters.

FHWA's (and Clark Mackey's) concerns have been addressed as follows in Section 3.4.A:

4. Do not begin drilling for a shaft located 3 diameters center-to-center or closer to an adjacent completed shaft until at least 48 hours after completion of placement of concrete for the completed shaft.
5. Do not begin drilling for a shaft located between 3 and 5 diameters center-to-center from an adjacent completed shaft until at least 24 hours after completion of placement of concrete for the completed shaft.
6. No concrete placement time restrictions for shafts 5 diameters center-to-center or greater apart.

Others (as appropriate)

The following comments were received from John Butterfield, R-2 Materials Engineer:

02455 looks OK to me. Although one could argue that we don't necessarily need (AE) concrete in a pile, it doesn't hurt, and it probably doesn't cost any more. It's one less mix design, i.e., a "no air" design that a producer has to input into the automated batching system.

02466 has me baffled.

1....If we want A(AE) for piles, why not for drilled shafts? or vice-versa...

2....Why do we make a reference to 03055 with the following modifications and then immediately say "Maintain the same minimum compressive strength at 28 days?" ??????

3....Why do we specify "A" concrete (5 to 5.5 bag mix) and then require the contractor to "Add at least one bag of additional cement per cubic yard of concrete for at least seven bags of cement per cubic yard?" Just say that when placing under water increase the cement content to 7 bags/cu.yd.(and eliminate the strength requirement, which at that point is irrelevant).

4....One thing that has always troubled me is how we specify aggregate gradation requirements for both coarse and fine aggregates and then make the statement to "Proportion concrete to facilitate pumping."

Depending on the aggregate source, this has the potential of being mutually exclusive. We wouldn't ever do that!!!

5.....The statement, "Use water reducers or plasticizers..." is multiply redundant.

To address John's concerns, 02466 Section 2.1 was edited to read as follows:

2.1 PORTLAND CEMENT CONCRETE

A. Class A(AE), unless otherwise specified. Follow Section 03055. B. Modify as follows when placed under water:

1. Use at least seven bags of cement per cubic yard.
2. Provide equipment capable of pumping specified concrete.
3. Use high range water reducers (super plasticizers) per Section 03055.
4. Keep slump between 4 inches and 8 inches when tested at the truck.

E. Other impacted areas, systems, or personnel. (Consider all impacts and possible changes to these areas during the preparation process. Coordinate with all appropriate areas for the respective item. List all impacts and action taken.)

1. Minimum Sampling and Testing Guide (MS&T Guide)

No impacts.

2. Business Systems (Electronic Bid System, Project Development Business System, Electronic Program Management, Computer-Aided Drafting and Design, etc.)

No impacts other than spec title change.

3. Implementation Plan (Provide detailed instructions on how the subject item will be implemented to include notification of all interested parties and training requirements.)

Can be implemented as a supplemental, or we can wait until incorporation into the 2008 spec book. No training required.

F. Costs? (Estimates are acceptable.)

1. Additional costs to average bid item price.

No anticipated impacts.

2. Operational (For example, maintenance, materials, equipment, labor, administrative, programming).

No anticipated impacts.

3. Life cycle cost.

No anticipated impacts.

- G. Benefits? (Provide details that can be used to complete a Cost – Benefit Analysis.) (Estimates are acceptable.) (If no costs, what is the benefit of making this change?)

The specification has been clarified and improved in many areas due to the changes that will be made. The clarifications with waiting times between placing concrete in adjacent drilled shafts should make shaft foundations more constructible. The title change from “Drilled Caisson” to “Drilled Shafts” to meet industry standards is also important (something that has been needed for years).

- H. Safety Impacts?

None

- I. History? Address issues relating to the current usage of the item and past reviews, approvals, and/or disapprovals.

No history. All changes have been a result of review in preparation for the new 2008 spec book.

Priority Explanation

Enter the appropriate priority in the box on the first page of the document.

- | | |
|------------|---|
| Priority 1 | Upon posting, this impacts all projects in construction and design with a Change Order, Addenda, and immediate change to projects being advertised. |
| Priority 2 | Upon posting, this impacts projects being advertised. |
| Priority 3 | Upon posting, the approved standard takes effect four weeks later for projects being advertised. |

Supplemental Specification
2005 Standard Specification Book

SECTION 02466

DRILLED ~~CAISSON~~SHAFTS

Delete Section 02466 and replace with the following:

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Material, equipment, and procedures for constructing drilled ~~caisson~~shafts.

1.2 RELATED SECTIONS

- A. Section 03055: Portland Cement Concrete.
- B. Section 03211: Reinforcing Steel and Welded Wire.

1.3 QUALITY ASSURANCE

- A. If ~~caisson~~shaft installation is unsatisfactory or the shaft cannot be completed within the required tolerances:
1. Immediately remove the reinforcing steel cage and the concrete.
 2. Replace the reinforcing cage and place concrete in a satisfactory manner.
 - ~~33~~ Submit proposed remedial action for approval if the reinforcing steel and concrete cannot be removed.
 4. Furnish materials and work necessary to correct out-of-tolerance drilled shaft construction at no cost to the Department.

1.4 ACCEPTANCE

- A. Drilled ~~caisson~~shafts may be accepted at a reduced price when the concrete strength is below that specified.
1. Price adjustment pay factor following Section 03055.
 2. The Department applies the pay factor to the measurement of the total length of any ~~caisson~~shaft containing concrete with strength tests falling below that specified.

1.54 Submittals

- A. Submit procedure to Engineer to place concrete under water.

PART 2 PRODUCTS

2.1 PORTLAND CEMENT CONCRETE

- A. Class A ~~(AE)~~, unless otherwise specified in the Plans. Follow Section 03055.
- B. Modify as follows when placed under water:
- ~~1. Maintain the same minimum compressive strength at 28 days.~~
 - ~~12. Add at least one bag of additional cement per cubic yard of concrete for a minimum of~~ Use at least seven bags of cement per cubic yard.
 - ~~23. Proportion concrete to facilitate pumping~~ Provide equipment capable of pumping specified concrete.
 - ~~34. Use~~ high range water reducers ~~or (super-~~ plasticizers) per Section 03055.
 - ~~45. Keep slump between 4 inches and 8 inches when tested at the truck.~~

2.2 REINFORCING STEEL

- A. Refer to Section 03211.

2.3 ~~CAISSON~~ DRILLING EQUIPMENT

- A. Capable of:
1. Drilling holes ~~to~~ of the required diameter, location, alignment and depth in the type of materials ~~located at the footings~~ present at the shaft locations.
 2. Installing and removing casing.

PART 3 EXECUTION

3.1 PREPARATION

- A. Drilling holes:
1. Drill straight, vertical holes to the tip elevations shown on the plans or as determined by Engineer.
 2. Remove all loose material from the bottom of the drilled holes before placing concrete.

- ~~3.3.~~ Do not use water or slurry for drilling operations.
- ~~4.~~ Do not begin drilling for a shaft located ~~3three~~ diameters center-to-center or closer to an adjacent completed shaft until at least 48 hours after completion of placement of concrete for the completed shaft.
- ~~5.~~ Do not begin drilling for a shaft located between ~~3three~~ and ~~5five~~ diameters center-to-center from an adjacent completed shaft until at least 24 hours after completion of placement of concrete for the completed shaft.
- ~~6.~~ No concrete placement time restrictions for shafts ~~5five~~ diameters center-to-center or greater apart.

B. Casing:

1. Furnish and place casing when required to prevent the drilled hole from caving ~~in and any time groundwater is encountered. and r~~ Remove casing as the concrete is placed.
2. Keep the bottom of the casing between 2 ~~feetft~~ and 5 ~~feetft~~ below the top of the concrete surface when withdrawing.
- ~~3.3.~~ Prevent concrete separation when withdrawing the casing.

3.2 CONSTRUCTION TOLERANCES

- A. Install the ~~D~~drilled shaft within 3.0 inches of the plan position in the horizontal plane at the plan elevation of the top of the shaft. (Note from Standards: Does the tolerance in A and C need to be that specific to show a decimal followed by a zero? I split B in to two paragraphs.)
- B. Install the drilled shaft such that the vertical alignment of the shaft excavation does not vary from the plan alignment by more than 0.25 inches/foot of depth.
- C. Install the drilled shaft such that the top of the reinforcing steel cage is no more than 2.0 inches above or below the plan elevation.

3.3 PLACING REBAR CAGES

- A. Rigidly brace the reinforcing cage with additional reinforcing steel as needed to retain its configuration during handling and construction. Loose bars will not be permitted. Pick cage in several locations as necessary to maintain cage shape and straightnessalignment during placement.

3.42 PLACING CONCRETE

- A. Fill drilled holes within 24 hours after drilling.

- B. Prevent concrete from striking the steel-reinforcing cage during free-fall. Do not allow the free-fall of concrete to exceed 5 feetft without the use of a tremie or a flexible metal spout.
- C. Do not vibrate concrete during initial placement. Remove all muck laitance and degraded concrete from the caissonshaft.
- D. Vibrate the concrete during placement for at least the top 10 feetft of the shaft. ~~Vibrate the concrete during placement to at least 10 feet below top of casing.~~

3.53 PLACING CONCRETE UNDER WATER

- A. Submit procedure to Engineer and secure Engineer's written approval to place concrete under water.
- B. Use concrete pumping equipment capable of pumping at least 50 yd³/hr against a minimum 20 feetft head of concrete measured from the discharge end of the pump hose extension (tremie pipe).
- C. Use a rigid, steel pipe pump hose extension for the tremie pipe with tight couplings straight to within ½ inch in 10 feetft.
 - 1. Length of extension must be greater than or equal to the depth of the caissonshaft.
 - 2. Inside diameter must be greater than or equal to the concrete pump discharge hose, but not more than one-half of the inside diameter of the reinforcing cage.
- D. Purge the tremie pipe of water.
 - 1. Insert a sturdy plastic ball or equivalent into the top of the pump hose extension before connecting the hose from the concrete pump.
 - 2. The ball must fit snugly into the pump hose extension when the hose is filled. The hose must be strong enough to resist rupture.
 - 3. Prime the hose and pipe with Portland CCement slurry.
- E. Lower a small diameter pole with an attached flat plate into the hole to determine the top surface of concrete.
 - 1. Both pole and pipe should be marked so that the length of penetration can be determined immediately.
 - 2. Prevent the end of the pipe from becoming plugged with soil from the bottom of the hole.
- F. Begin pumping the concrete immediately after setting the reinforcing cage and pipe in the hole. Do not begin raising the pipe until the concrete surface is 10 feetft above the bottom of the pipe.

- G. Keep the bottom of ~~the~~ the tremie pipe at least 5 feetft below the top of the concrete until the pour-placement is complete and all muck, laitance, and all unsuitable concrete is removed. Provide a positive hold down if the pipe floats to ensure that the minimum 5 feetft penetration is maintained.

3.64 FIELD QUALITY CONTROL

- A. If plugging of the pipe, equipment breakdown, or loss of the seal at the end of the pipe occurs:
1. Pull the pipe, reset it 2 feetft below the top of the concrete, and purge it.
 2. Lower the pipe to at least 5 feetft below the top of the placement, and continue pumping concrete until all degraded concrete has lifted to the top of the caissonshaft.
 3. Remove all muck, laitance and degraded concrete.

END OF SECTION

Standards Committee Submittal Sheet

Name of preparer: John Butterfield/Tim Biel
Title/Position of preparer: Region Two Materials Engineer/Engineer for Materials
Specification/Drawing/Item Title: Untreated Base Course
Specification/Drawing Number: 02721

Enter appropriate priority level:

(See last page for explanation) 3

Sheet not required on editorial or minor changes to standards. Check with Standards Section.

NOTES:

1. All Submittal Sheets must be completed and sent to the Standards and Specifications Section by the Standards Committee suspense date as shown on the Web.
(<http://www.udot.utah.gov/index.php/m=c/tid=303>)
2. The Preparer of the Submittal Sheet or the Standards Committee member (or authorized substitute) responsible for the submittal must be present at the Standards Committee meeting and capable of discussing and answering all questions related to the submittal. The item will be postponed to a later meeting if one of these people is not present.
3. Notify the Standards and Specifications Section immediately of any changes that impact the presentation to include absence of sponsor or delay in presentation.

Complete the following: (Use additional pages as needed.)

- A. Why? Detail the reason for changing the Standard (Specification or Drawing), what has initiated a new Standard, or what has caused a new or changed item of interest.

Significant rewrite based on requiring more consistent gradations and quality control. Changed the application descriptions to allow for easier management of quantities, pay and testing frequencies based on application. Significant editorial comments and adjustments made based on issues with submittals, qualifications, etc.

- B. How is Measurement and Payment handled? Existing (from the measurement and payment document), modified, or new measurement and payment to be included with all Standard Specifications or Supplemental Specifications.

Modifications to pay item will include changing from UTBC 1" or ¾" minus to a straight UTBC pay item. This has already been communicated to PDBS.

- C. Stakeholder Notification for AGC and ACEC:

By email provide the AGC and ACEC Standards Committee member a copy of all pertinent information relating to the specification or drawing. Detail all responses below. Indicate if no comments were received.

Note: There is a two-week response time set for this item.

Refer to the Standards Committee Web site, Members page at <http://www.udot.utah.gov/index.php/m=c/tid=659> for the respective e-mail addresses.

AGC Comments: (Use as much space as necessary.)

Significant comments from Granite, Geneva, Staker-Parsons and Blain Rees have been incorporated over the last calendar year through project specials and Pavement Council discussions.

ACEC Comments: (Use as much space as necessary.)

No comments

- D. Stakeholders? From the list provided, document the stakeholders contacted, detailing: the company, name of contact, how contacted (by phone, email, hard copy, or in person), concerns, and comments of the change. Stakeholders:

Note: There is a two-week response time set for this item. Allow Stakeholders two weeks to process and respond to coordination requests. All areas should try to complete review and comment as soon as possible but within two weeks.

In-house (for example, preconstruction, materials, construction, safety, design, maintenance) (Include all applicable in-house areas even if not listed above.)

Desna Bergold, Region Two

Construction Engineers

Karl Verhaeren

Contractors (Any additional contacts beyond "C" above.)

*****Has gone through 16 months of revisions through Utah Pavement Council, including representatives from Staker-Parsons, Geneva, Granite*****

Suppliers

*****Has gone through 16 months of revisions through Utah Pavement Council, including representatives from Staker-Parsons, Geneva, Granite and Blain Rees*****

Consultants (as required) (Any additional contacts beyond "C" above.)

FHWA (To be accomplished as part of the two-week process before submitting to the Standards and Specifications Section for inclusion on the Standards Committee agenda.) (This is in addition to the requirements of UDOT Policy 08A5-1, procedure 08A5-1.3.)

Others (as appropriate)

RME Group approved

- E. Other impacted areas, systems, or personnel. (Consider all impacts and possible changes to these areas during the preparation process. Coordinate with all appropriate areas for the respective item. List all impacts and action taken.)

1. Minimum Sampling and Testing Guide (MS&T Guide)

Changes are currently in the specification under section 1.4. Will be cut and pasted into MS&T with next MS&T update.

2. Business Systems (Electronic Bid System, Project Development Business System, Electronic Program Management, Computer-Aided Drafting and Design, etc.)

Will impact the pay item description

3. Implementation Plan (Provide detailed instructions on how the subject item will be implemented to include notification of all interested parties and training requirements.)

Publishing the specification, notice will be given at Pavement Council. Already out as a state-wide special provision.

- F. Costs? (Estimates are acceptable.)

1. Additional costs to average bid item price.

Projects have seen around a \$1.00 per ton increase (Out of \$12 to \$16) in unit price.

2. Operational (For example, maintenance, materials, equipment, labor, administrative, programming).

Puts testing onus on the Contractor. Requires rework or removal if not in specification. No pay adjustments.

3. Life cycle cost.

Should be significant increase due to elimination of marginal and inconsistent materials.

- G. Benefits? (Provide details that can be used to complete a Cost – Benefit Analysis.) (Estimates are acceptable.) (If no costs, what is the benefit of making this change?)

Less workload and better timing for Region Field personnel. Increase in quality of structural portions of material. Elimination of loopholes that allowed materials that do not meet intent of specification.

- H. Safety Impacts?

None

- I. History? Address issues relating to the current usage of the item and past reviews, approvals, and/or disapprovals.

Has been out on projects for over a year as a special provision. Have made two significant revisions based on comments from industry.

Priority Explanation

Enter the appropriate priority in the box on the first page of the document.

- | | |
|------------|---|
| Priority 1 | Upon posting, this impacts all projects in construction and design with a Change Order, Addenda, and immediate change to projects being advertised. |
| Priority 2 | Upon posting, this impacts projects being advertised. |
| Priority 3 | Upon posting, the approved standard takes effect four weeks later for projects being advertised. |

**Supplemental Specification
2005 Standard Specification Book**

SECTION 02721

UNTREATED BASE COURSE (UTBC)

Delete Section 02721 and replace with the following:

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Production, construction, and compaction of ~~untreated base course material.~~ UTBC used for pavements, shoulders, and incidental construction.

1.2 RELATED SECTIONS

- A. Section 01572: Dust Control and Watering

1.3 REFERENCES

- A. AASHTO T 11: Materials Finer than ~~75- μ m (No. 200)~~ 75- μ m (No. 200) Sieve in Mineral Aggregates by Washing

- ~~—B. AASHTO T 19: Unit Weight~~ B. AASHTO T 19: Bulk Density (“Unit Weight”) and Voids in Aggregate

- C. AASHTO T 27: Sieve Analysis of Fine and Coarse Aggregates

- D. AASHTO T 89: Determining the Liquid Limit of Soils

- E. AASHTO T 90: Determining the Plastic Limit and Plasticity Index of Soils

- F. AASHTO T 96: Resistance to Degradation of Small-Sized Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine

- ~~—G. AASHTO T 138: This is shown in Article 1.4 G but it is not listed in my AASHTO book.~~

—G. AASHTO T 180: Moisture-Density Relations of Soils Using a 4.54 kg (10 lb) Rammer and 457 mm (18 in) Drop

H. AASHTO T 193: The California Bearing Ratio

~~I. AASHTO T 308: Determining the Asphalt Binder Content of Hot Mix Asphalt (HMA) by the Ignition Method~~
I. AASHTO T 255: Total Evaporable Moisture Content of Aggregate by Drying

~~J. AASHTO T 310: Field~~
~~J. AASHTO T 310: In-place Density and Moisture Content by Nuclear Gage of Soil and Soil Aggregate by Nuclear Methods (Shallow Depth)~~

1.4 DEFINITIONS

~~A. Mean of the Deviations:~~ The sum of the absolute values of the deviations divided by the number of tests in the lot.

K. AASHTO TP 61: Determining the Percent of Fracture in Coarse Aggregate

L. UDOT Minimum Sampling and Testing Requirements

1.4 MINIMUM SAMPLING AND TESTING REQUIREMENTS

A. Contractor Submittals

1. Source Suitability

2. Dry Rodded Unit Weight, AASHTO T 19

3. Liquid Limit/ Plastic Index, AASHTO T 89 and AASHTO T 90

4. Aggregate Wear, AASHTO T 96

5. Gradation, AASHTO T 11 and AASHTO T 27

6. CBR with a 10 lb surcharge measured at 0.20 inch penetration, AASHTO T 193

7. Fracture Face, AASHTO TP 61

8. Job Mix Gradation

a. Approved by the Resident Engineer

B. Submittal Approval

1. Region Materials Engineer

C. Quality Assurance - Type I Placement

1. Gradation - A lot consists of the quantity of UTBC processed, placed to line and grade in a day. Divide the lot into sublots of approximately 500 yd³ each.

a. Conduct a minimum of one gradation within each sublot. Refer to AASHTO T 11 and AASHTO T 27.

2. Maximum Dry Density and Optimum Moisture Content Determination

a. Conduct a minimum of one laboratory density determination for approximately 10,000 yd³, to be used as a standard for field density determinations and field moisture content. Refer to AASHTO T 180, Method D.

3. Density - A lot consists of the quantity of UTBC processed, placed to line and grade and compacted in a day. Divide the lot into sublots of approximately 2500 yd² each.

a. Conduct a minimum of one density test within each sublot. Refer to AASHTO T 310.

4. Moisture Content - A lot consists of the quantity of UTBC processed, placed to line and grade and compacted in a day. Divide the lot into sublots of approximately 2500 yd² each.

a. Conduct a minimum of one moisture test within each sublot. Refer to AASHTO T 255.

D. Quality Assurance - Type II Placement

1. Maximum Dry Density and Optimum Moisture Content Determination

- a. Conduct a minimum of one laboratory density determination for approximately 10,000 yd³, to be used as a standard for field density determinations and field moisture content. Refer to AASHTO T 180, Method D.
2. Conduct a minimum of one random moisture, gradation, and density test within each subplot according to Table 1. Refer to AASHTO T 11, AASHTO T 27, AASHTO T 255, and AASHTO T 310.

Table 1

<u>Items of Work</u> <u>(Collective Quantities)</u>	<u>Sublot Size</u>
<u>Curb, Curb and Gutter</u>	<u>10000 ft</u>
<u>Sidewalk</u>	<u>3000 yd²</u>
<u>Driveway, Pedestrian Access</u> <u>Ramp, Waterway, Flatwork,</u> <u>and other items not listed above</u>	<u>25000 ft²</u>

E. Quality Assurance - Type III Placement

1. Moisture Content

a. Determine Moisture Content acceptance minimum of twice daily during placement, contractor provided optimum moisture may be used as the moisture standard. Refer to AASHTO T 255 or AASHTO T 310.

2. Density

a. Visual Inspection:

1) Document method and equipment used for placement, appearance of gradation uniformity, moisture content, compactive effort, and final appearance.

F. Point of Acceptance for Gradation

1. On the grade after processing, prior to compaction

G. Documentation/Report

1. Aggregate Testing Report: T 138 (modified)

2. Visual Inspection Report

3. Obtain these reports from the UDOT Minimum Sampling and Testing Requirements, from the UDOT website. Refer to <http://www.udot.utah.gov/index.php/m=c/tid=719>.

1.54 SUBMITTALS

A. Ten days before placement begins, submit a written report on the following:

Untreated Base Course (UTBC)
02721 - Page 4 of 14

April 26, 2007

- ~~1. Aggregate suitability. Refer to this Section, Part 2.~~
- ~~2. Name of supplier and source.~~
- ~~3. Job mix gradation including single values for each sieve size based on the dry weight of the aggregate.~~
- ~~B. Resubmit all quality documents 24 hours before a day's production starts if a change in source is required.~~
 - ~~1. Changes must fall within bands of Table 2 in this Section, and are subject to approval.~~
 - ~~2. Retroactive changes are allowed only for the first day's production for each construction season.~~

~~1.6 QUALITY ASSURANCE~~

- ~~A. Remove products found defective after installation and install acceptable products at no additional cost to the Department.~~

~~1.7 ACCEPTANCE~~

- ~~A. Engineer takes random sample from the grade.~~
- ~~B. Acceptance will be on a lot by lot basis where a lot consists of a single layer of not more than 8000 yd² placed to line and grade and compacted. Divide the lot into five sublots of approximately 1600 yd² each. When working with small daily amounts, limit lot to maximum of two weeks worth of production and adjust subplot size accordingly.~~
 - ~~1. Conduct one random moisture, gradation and density test within each subplot. AASHTO T 310.~~
 - ~~a. If the Mean of the Deviations of test results varies from the Combined Aggregate Target more than the minimum shown under the 0.70 pay factors of Table 2, the pay factor for the material allowed to remain in place is 0.50. This applies only if the Engineer does not order correction or removal of any or all of the material represented by the tests.~~
 - ~~b. The results of five density tests must indicate that the average of 97 percent of maximum laboratory density has been met with no test less than 94 percent. AASHTO T 180, Method D.~~
- ~~C. Do not place additional material on any unaccepted layer.~~
- ~~D. Rework unacceptable material at no additional cost to the Department.~~
- ~~E. Price Adjustments - Rap Content (AASHTO T 308)~~
 - ~~1. Based upon average asphalt cement content per lot.~~

Untreated Base Course (UTBC)

02721 - Page 5 of 14

April 26, 2007

2. ~~Apply price adjustment to entire lot quantity.~~

Table 1

Asphalt-Cement Content over Design Content (x) (% by Weight of Mix)	Price Adjustment (Dollars/ton)
$0.2 \leq x < 0.4$	-0.30
$0.4 \leq x < 1.0$	-1.50
$x \geq 1.0$	Reject*

~~* Lots in Reject due to RAP content may stay in place, at the direction of the Engineer, with a 50 percent price adjustment.~~

	Table 2 —Pay Factors for Aggregate Gradation						
	Mean of The Deviations of Sieve Gradation Results From The Combined Aggregate Target — Expressed in Percentage Points						
	SIEVE SIZES	Pay Factor	1 TEST Max-min	2 TESTS Max-Min	3 TESTS Max-Min	4 TESTS Max-Min	5 TESTS or More Max-Min
	½ inch and larger	1.00	0—15	0.0—12.1	0.0—10.8	0.0—10.0	0.0—9.5
		0.95	16—17	12.2—13.9	10.9—12.4	10.1—11.5	9.6—11.0
		0.90	18—19	14.0—15.1	12.5—13.5	11.6—12.5	11.1—11.9
		0.80	20—21	15.2—17.2	13.6—15.3	12.6—14.2	12.0—13.5
		0.70	22—23	17.3—18.8	15.4—16.7	14.3—15.5	13.6—14.7
	¾ inch	1.00	0—15	0.0—11.5	0.0—9.8	0.0—8.8	0.0—8.0
		0.95	16—17	11.6—13.3	9.9—11.3	8.9—10.1	8.1—9.2
		0.90	18—19	13.3—14.4	11.4—12.3	10.2—11.0	9.3—10.0
		0.80	20—21	14.5—16.3	12.4—13.9	11.1—12.5	10.1—11.4
		0.70	22—23	16.4—17.9	14.0—15.2	12.6—13.6	11.5—12.4
	No. 4	1.00	0—14	0.0—10.5	0.0—8.8	0.0—7.8	0.0—7.0
		0.95	15—17	10.6—12.1	8.9—10.1	7.9—9.0	7.1—8.0
		0.90	18	12.2—13.1	10.2—11.0	9.1—9.8	8.1—8.7
		0.80	19—20	13.2—14.9	11.1—12.5	9.9—11.1	8.8—10.0
		0.70	21—22	15.0—16.3	12.6—13.6	11.2—12.1	10.1—10.8
	No. 16	1.00	0—11	0.0—8.2	0.0—6.9	0.0—6.2	0.0—5.6
		0.95	12—13	8.3—9.4	7.0—7.9	6.3—7.1	5.7—6.4
		0.90	14	9.5—10.3	8.0—8.6	7.2—7.8	6.5—7.0
		0.80	15—16	10.4—11.6	8.7—9.8	7.9—8.8	7.1—8.0
		0.70	17	11.7—12.7	9.9—10.7	11.7—12.7	8.1—8.7
	No. 50	1.00	0—9	0.0—7.0	0.0—6.1	0.0—5.5	0.0—5.2
		0.95	10	7.1—9.0	6.2—7.0	5.6—6.3	5.3—6.0
		0.90	11	9.1—8.8	7.1—7.6	6.4—6.9	6.1—6.5
		0.80	12—13	8.9—10.0	7.7—8.7	7.0—7.8	6.6—7.4
		0.70	14	10.1—10.9	8.8—9.5	7.9—8.5	7.5—8.1
	No. 200	1.00	0—4.5	0.0—3.4	0.0—2.9	0.0—2.5	0.0—2.3
		0.95	4.6—5.2	3.5—3.9	3.0—3.3	2.6—2.9	2.4—2.6
		0.90	5.3—5.6	4.0—4.3	3.4—3.6	3.0—3.1	2.7—2.9
		0.80	5.7—6.4	4.4—4.8	3.7—4.1	3.2—3.6	3.0—3.3
		0.70	6.5—7.0	4.9—5.3	4.2—4.5	3.7—3.9	3.5—3.6

—F.— Price Adjustments— Gradation:

—1.— Based upon number of samples per lot and the minimum pay factor.

—2.— Pay factors for aggregate gradation when tested in accordance with AASHTO T 27 are indicated in Table 2.

Untreated Base Course (UTBC)

02721 - Page 7 of 14

April 26, 2007

Doc
Page
164

- A. Submit a written report for approval for each aggregate class and source, a minimum of five working days prior to placement. Include the following:
1. Aggregate suitability. Refer to this Section, Part 2, Products.
 2. Name of supplier and location of source.
 3. Maximum Dry Density and Optimum Moisture Content. Refer to AASHTO T 180, Method D.
 4. Job mix gradation including single values for each sieve size, No. 4 and finer, within the gradation limits of Table 3.

1.65 ACCEPTANCE

- A. Acceptance sampling and testing of material is in accordance with UDOT Minimum Sampling and Testing Requirements.

AB. Type I Placement – Pavement Section (Includes placement for Curb or Curb and Gutter when in conjunction with placement for pavement section.)

1. Use Class A aggregate. Table 2
2. The Engineer takes random samples from the grade and tests for moisture, gradation, and laboratory density, and performs In-place Density determinations. Refer to this Section, article 1.4 Minimum Sampling and Testing Requirements.
3. Meet gradation limits and applicable tolerances of Table 3 for each gradation test. Each subplot will be evaluated separately and not averaged with other sublots.
4. Meet minimum density test average of 97 percent of maximum laboratory density with no test less than 94 percent.

CB. Type II Placement – Incidental (Includes placement for Curb, Curb & Gutter, Driveways, Pedestrian Access Ramps, Sidewalk, Waterways, Flatwork, and other items of work in the contract to which UTBC is included and not measured or paid for separately.)

1. Use Class A or B aggregate, Table 2.
2. The Engineer takes random samples from the grade and tests for moisture, gradation, and laboratory density, and performs In-place Density determinations. Refer to this Section, article 1.4
3. Meet gradation limits and applicable tolerances of Table 3 for each gradation test. Each subplot will be evaluated separately and not averaged with other sublots.
4. Meet minimum density test average of 95 percent of maximum laboratory density with no test less than 92 percent.

DC. Type III Placement – Shoulder

1. Use Class A, B, or C aggregate. Table 2.

2. Adjust moisture content prior to compaction. Refer to this Section, article 3.1, Installation.

ED. Material not meeting the gradation requirements may be allowed to remain in-place at the discretion of the Engineer, provided density requirements are met. However, additional lots may not be placed until the deficiencies are addressed and corrected.

FE. When directed by the Engineer, correct material that does not meet the specified criteria by scarifying, placing additional material, re-mixing, reshaping and re-compacting. Rework unacceptable material at no additional cost to the Department.

GF. Do not place additional material on any unaccepted layer.

HG. When directed by the Engineer, remove products found defective after placement and replace with acceptable products at no additional cost to the Department

PART 2 PRODUCTS

2.1 AGGREGATES

~~A. Clean.~~ A. Well-graded, clean, hard, tough, durable and sound mineral aggregates consisting of crushed stone, crushed gravel or crushed slag; free of detrimental and organic matter; and complies with Table 3 and Table 4 organic matter and contamination from chemical or petroleum products; meeting the requirements of Table 2.

~~Table 3~~ Table 2

Aggregate Properties			
	<u>Aggregate Class</u>		
	<u>A</u>	<u>B</u>	<u>C</u>
Dry Rodded Unit Weight	Not less than 75 lb/ft ³		
Material Passing No. 40 Sieve	Non-plastic		
<u>Liquid Limit/ Plastic Index</u>	<u>Non-plastic</u>		<u>PI ≤ 6</u>
Aggregate Wear	Not to exceed 50 percent.		
Dry Weight Values	Within bands shown in Table 4		

<u>Gradation Limits</u>	<u>Table 4</u>		<u>AASHTO T 11</u> <u>AASHTO T 27</u>
<u>Gradation</u>	<u>Table 3</u>		<u>AASHTO T 11</u> <u>AASHTO T 27</u>
<u>CBR with a 10 lb. surcharge</u>	<u>70% Minimum</u>		<u>AASHTO T 193</u>
<u>CBR with a 10 lb surcharge measured at 0.20 inch penetration</u>	<u>70% Minimum</u>	<u>N/A</u>	<u>AASHTO T 193</u>
<u>Two Fractured Faces</u>	<u>50 % Min</u>	<u>N/A</u>	<u>N/A</u> <u>AASHTO TP 61</u>

Table 4
Gradation Limits—Single Value Job Mix Formula

<u>Two Fractured Faces</u>	<u>50 % Min</u>	<u>N/A</u>	<u>N/A</u>	<u>AASHTO TP 61</u>
----------------------------	---------------------	------------	------------	---------------------

- B. Establish the job mix (target) gradation for the 3/4 inch sieve and finer within the gradation limits. The Job Mix Gradation Tolerance is the allowable deviation from the job mix (target) gradation on the applicable sieves. All other percents passing will be within the gradation limits. Refer to AASHTO T 11 and AASHTO T 27.

Table 3
Gradation Limits

<u>Sieve Size</u>	<u>Percent Passing of Total Aggregate (Dry Weight)</u>		
	<u>1-1/2 inch</u>	<u>1 inch</u>	<u>3/4 inch</u>
<u>Sieve Size</u>	<u>Job Mix Gradation Target Band</u>		<u>Job Mix Gradation Tolerance</u>
<u>1-1/2 inch</u>	<u>100</u>	<u>—</u>	<u>—</u>
<u>1 inch</u>	<u>—</u>	<u>100</u>	<u>—</u>
<u>3/4 inch</u>	<u>81—91</u>	<u>—</u>	<u>100</u>
<u>1/2 inch</u>	<u>67—77</u>	<u>79—91</u>	<u>—</u>
<u>3/8 inch</u>	<u>—</u>	<u>—</u>	<u>78—92</u>
<u>No. 4</u>	<u>43—53</u>	<u>49—61</u>	<u>55—67</u>
<u>No. 16</u>	<u>23—29</u>	<u>27—35</u>	<u>28—38</u>
<u>No. 200</u>	<u>6—10</u>	<u>7—11</u>	<u>7—11</u>

<u>1-1/2 inch</u>	<u>100</u>	
<u>1 inch</u>	<u>90 - 100</u>	
<u>3/4 inch</u>	<u>70 - 85</u>	<u>±9.0</u>
<u>1/2 inch</u>	<u>65 - 80</u>	<u>±9.0</u>
<u>3/8 inch</u>	<u>55 - 75</u>	<u>±9.0</u>
<u>No. 4</u>	<u>40 - 65</u>	<u>±7.0</u>
<u>No. 16</u>	<u>25 - 40</u>	<u>±5.0</u>
<u>No. 200</u>	<u>7 - 11</u>	<u>±3.0</u>
<u>Gradation Limits</u>		
<u>Sieve Size</u>	<u>Job Mix Gradation Target Band</u>	<u>Job Mix Gradation Tolerance</u>
<u>1-1/2 inch</u>	<u>100</u>	
<u>1 inch</u>	<u>90 - 100</u>	
<u>3/4 inch</u>	<u>70 - 85</u>	<u>±9.0</u>
<u>1/2 inch</u>	<u>65 - 80</u>	<u>±9.0</u>
<u>3/8 inch</u>	<u>55 - 75</u>	<u>±9.0</u>
<u>No. 4</u>	<u>40 - 65</u>	<u>±7.0</u>
<u>No. 16</u>	<u>25 - 40</u>	<u>±5.0</u>
<u>No. 200</u>	<u>7 - 11</u>	<u>±3.0</u>

~~Untreated Base Course: Based on~~ Untreated Base Course: Percent passing based on total aggregate (dry weight), and fine and coarse aggregate having approximately the same bulk specific gravities.

- B. ~~Recycled Asphalt Pavement (RAP): When the Contractor elects to use RAP in the untreated base course, meet the following:~~
1. ~~Materials manufactured by rotomilling, crushing, or other means approved by the Engineer.~~
 2. ~~Mechanically blend with the virgin material, resulting in a homogeneous material. Do not use windrows and graders/dozers for blending.~~
 3. ~~Do not exceed target asphalt cement content, as calculated by total weight of mix, for final blend material (virgin and RAP).~~
 4. ~~Meet all requirements of this Section, article 2.1, Aggregates, with the following modifications:~~
 - a. ~~L.A. Wear requirement applies to virgin aggregate portion only.~~
 - b. ~~Non plastic requirement applies to virgin aggregate portion only.~~
 - c. ~~One fractured face and sand equivalent requirements apply to combined material residue from ignition oven.~~

PART 3 EXECUTION

3.1 JOB MIX GRADATION

A. ~~Submit a written job mix gradation for approval before production, including single values for each sieve size identified in Table 2, based on the dry mass of the aggregate.~~

B. ~~Meet Table 4 bands for dry mass values.~~

C. ~~For Blends using RAP:~~

1. ~~Limit target AC content to two percent by total weight of combined material.~~
2. ~~Submit two sets (five samples each) of ignition oven calibration samples containing blended material.~~
3. ~~Submit one set (five samples) of ignition oven calibration samples containing 100 percent virgin material.~~
4. ~~Modify drying procedures for gradation testing to minimize softening of the RAP asphalt cement. Reduce temperature and lengthen drying time. Recommended oven temperatures are approximately 140 degrees F with a drying time of eight to 12 hours or until sample does not continue to lose mass.~~

D. ~~Procedures for Changing the Job-Mix Gradation~~

1. ~~Meet the requirements of this Section, article 2.1, Aggregates for all changes.~~

INSTALLATION

1. ~~Submit changes in writing 24 hours prior to start of production for approval by the Engineer.~~

~~3.2~~ **INSTALLATION**

- ~~2.A.~~ Mixing: Provide ~~an optimum~~ moisture content of ± 2 percent ~~of optimum~~ at the time of placement. Refer to AASHTO T 180, Method D and AASHTO T 255.
- ~~B.~~ Procedures for changing the Job-Mix Gradation
- ~~B.~~ Placing: Place layers in equal thickness and compact each layer to a thickness not to exceed 6 inches in depth. Do not place on a frozen subgrade or a frozen layer. Refer to Section 01572.
- ~~C.~~ Compaction: Meet requirements of this Section, article 1.7, Acceptance, paragraph, B1. Maintain optimum moisture content ± 2 percent.
- ~~1.~~ Within 2 feet of back walls of structure abutments and approach slabs, use a hand-operated vibratory compactor or a vibratory roller.
- ~~2.~~ For blends using RAP where maximum laboratory density (AASHTO T 180, Method D) accurate field density values cannot be determined due to Asphalt Cement content, meet 98 percent of maximum field density, with no test less than 96 percent of maximum field density.
- ~~a.~~ Maximum Field Density
- ~~b.~~ Determined by use of a repetitive roller pattern over a two adjacent locations. Maximum Field Density is defined as the average of the maximum value attained on a nuclear density gauge for each location prior to breakdown of the material.
- ~~c.~~ Re-determine at least once per day.
-
- ~~1.~~ Submit changes in writing 24 hours prior to placement for approval by the Engineer.
- ~~C.~~ Placing: Place in layers of uniform thickness and compact each layer to a thickness not to exceed a 6 inch depth. Do not place on any frozen surface. Refer to Section 01572.
- ~~D.~~ Finishing: Uniform line and grade with surface deviations no more than 3/8 inch ~~±~~ in 10 ft in any direction.
- ~~1.~~ Profile Tolerance — Correct any profile ~~deficiency of~~ deviations greater than 3/8 inch.
- ~~a.~~ Rework minimum of ~~4-inch~~ 4-inch lift to achieve homogeneous density.
- ~~b.~~ Determine limits of correction based on extent of ~~deficiency.~~ Extend work until existing deficiency is less than 3/8 inch deviation.
- ~~E.~~ Quality Control Testing — Submit a quality control plan to the Engineer prior to construction. Perform tests as stated in the Quality Control plan.

END OF SECTION

- c. Continue finishing until existing deviation is less than 3/8 inch.
- E. Compaction: Maintain optimum moisture content \pm 2 percent.
 - 1. Use appropriate compaction equipment adjacent to abutments, backwalls, approach slabs, wing walls, retaining walls, and other structures.
 - 2. Use a minimum of 2 passes with a roller for Type III placement or as directed by the Engineer.

END OF SECTION

Standards Committee Submittal Sheet

Name of preparer: John Butterfield/Tim Biel
Title/Position of preparer: Region Two Materials Engineer/Engineer for Materials
Specification/Drawing/Item Title: Hydrated Lime
Specification/Drawing Number: 02746

Enter appropriate priority level:

(See last page for explanation) 3

Sheet not required on editorial or minor changes to standards. Check with Standards Section.

NOTES:

1. All Submittal Sheets must be completed and sent to the Standards and Specifications Section by the Standards Committee suspense date as shown on the Web.
(<http://www.udot.utah.gov/index.php/m=c/tid=303>)
2. The Preparer of the Submittal Sheet or the Standards Committee member (or authorized substitute) responsible for the submittal must be present at the Standards Committee meeting and capable of discussing and answering all questions related to the submittal. The item will be postponed to a later meeting if one of these people is not present.
3. Notify the Standards and Specifications Section immediately of any changes that impact the presentation to include absence of sponsor or delay in presentation.

Complete the following: (Use additional pages as needed.)

- A. Why? Detail the reason for changing the Standard (Specification or Drawing), what has initiated a new Standard, or what has caused a new or changed item of interest.

Changes to determination of potable water, requirements for marination process and significant editorial changes relating to established sections instead of AASHTO test methods. Also included a submittal section.

- B. How is Measurement and Payment handled? Existing (from the measurement and payment document), modified, or new measurement and payment to be included with all Standard Specifications or Supplemental Specifications.

No Change

C. Stakeholder Notification for AGC and ACEC:

By email provide the AGC and ACEC Standards Committee member a copy of all pertinent information relating to the specification or drawing. Detail all responses below. Indicate if no comments were received.

Note: There is a two-week response time set for this item.

Refer to the Standards Committee Web site, Members page at <http://www.udot.utah.gov/index.php/m=c/tid=659> for the respective e-mail addresses.

AGC Comments: (Use as much space as necessary.)

No comments

ACEC Comments: (Use as much space as necessary.)

No comments

- D. Stakeholders? From the list provided, document the stakeholders contacted, detailing: the company, name of contact, how contacted (by phone, email, hard copy, or in person), concerns, and comments of the change. Stakeholders:

Note: There is a two-week response time set for this item. Allow Stakeholders two weeks to process and respond to coordination requests. All areas should try to complete review and comment as soon as possible but within two weeks.

In-house (for example, preconstruction, materials, construction, safety, design, maintenance) (Include all applicable in-house areas even if not listed above.)

Construction Engineers

Karl Verhaeren

Contractors (Any additional contacts beyond "C" above.)

*****Has gone through three revisions through Utah Pavement Council, including representatives from Staker-Parsons, Geneva, Granite*****

Suppliers

Does not affect suppliers

Consultants (as required) (Any additional contacts beyond “C” above.)

FHWA (To be accomplished as part of the two-week process before submitting to the Standards and Specifications Section for inclusion on the Standards Committee agenda.) (This is in addition to the requirements of UDOT Policy 08A5-1, procedure 08A5-1.3.)

Others (as appropriate)

RME Group approved

- E. Other impacted areas, systems, or personnel. (Consider all impacts and possible changes to these areas during the preparation process. Coordinate with all appropriate areas for the respective item. List all impacts and action taken.)

1. Minimum Sampling and Testing Guide (MS&T Guide)

Will require adjustment for potable water. Central Materials is aware.

2. Business Systems (Electronic Bid System, Project Development Business System, Electronic Program Management, Computer-Aided Drafting and Design, etc.)

No impact

3. Implementation Plan (Provide detailed instructions on how the subject item will be implemented to include notification of all interested parties and training requirements.)

Publishing the specification, notice will be given at Pavement Council.

- F. Costs? (Estimates are acceptable.)

1. Additional costs to average bid item price.

None

2. Operational (For example, maintenance, materials, equipment, labor, administrative, programming).

None

3. Life cycle cost.

None

- G. Benefits? (Provide details that can be used to complete a Cost – Benefit Analysis.) (Estimates are acceptable.) (If no costs, what is the benefit of making this change?)

Better consistency of incorporation of Hydrated Lime into HMA mixes.

- H. Safety Impacts?

None

- I. History? Address issues relating to the current usage of the item and past reviews, approvals, and/or disapprovals.

None

Priority Explanation

Enter the appropriate priority in the box on the first page of the document.

- Priority 1 Upon posting, this impacts all projects in construction and design with a Change Order, Addenda, and immediate change to projects being advertised.
- Priority 2 Upon posting, this impacts projects being advertised.
- Priority 3 Upon posting, the approved standard takes effect **four weeks** later for projects being advertised.

**Supplemental Specification
2005 Standard Specification Book**

SECTION 02746

HYDRATED LIME

Delete Section 02746 and replace with the following:

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Products and procedures for incorporating hydrated lime into all asphalt~~s~~ mixes.

1.2 REFERENCES

- A. AASHTO M 303: Lime for Asphalt Mixtures
- ~~B. AASHTO T 26: Quality of Water to be Used in Concrete (Can not delete. Still being used.)~~
- ~~C. AASHTO T 84: Specific Gravity and Absorption of Fine Aggregate~~
- ~~D. AASHTO T 85: Specific Gravity and Absorption of Coarse Aggregate~~
- ~~E. AASHTO T 255: Total Moisture Content of Aggregate by Drying~~
- ~~F~~B. ASTM C 110: Physical Testing of Quicklime, Hydrated Lime, and Limestone
- ~~G~~C. ASTM C 1097: Hydrated Lime for Use in Asphaltic-Concrete Mixtures
- ~~D~~. ASTM C 1602: Mixing Water Used in the production of Hydraulic Cement Concrete
- E. UDOT Quality Management Plan

1.3 QUALITY ASSURANCE

- A. Prequalification: Hydrated Lime, through ~~UDOT's~~UDOT's Quality Management Plan for Hydrated Lime, ~~(Section 510)~~.

1.4 SUBMITTALS

- A. Verification that the supplier is pre-qualified.

PART 2 PRODUCTS

2.1 HYDRATED LIME

- A. Hydrated Lime: Meet AASHTO M 303, Type I, as specified.
1. Conform physical requirements to ASTM C 1097, subparagraph d.1.
 2. Use test method ASTM C 110, paragraph 5.4.

2.2 WATER

- A. ~~Potable Water. AASHTO T 26~~Use ~~P~~potable ~~W~~water or water meeting ASTM C 1602. ~~AASHTO T 26~~

PART 3 EXECUTION

3.1 APPLICATION

- A. Add hydrated lime to all asphalt pavement mixes.
1. Add the determined quantity of lime, following mix design.
 2. Base the amount of hydrated lime used on the dry weight of the aggregate.
 3. Use either Method A or B, ~~following AASHTO T 84, AASHTO T 85, and AASHTO T 255,~~ unless Method B is called for in the bid schedule.
- B. Method A: Lime Slurry: One part lime and three parts water by weight.
1. Add lime at a minimum of 1 percent by weight.
 2. Maintain the lime slurry mix in a malted milk consistency.
 3. Deliver lime slurry to the twin shaft pugmill for mixing with aggregate.
 4. Quantity (percent) of lime may be adjusted based on results of Hamburg Wheel Tracker test. Adjust quantity (percent) of lime as directed by the Engineer, based on results of Hamburg Wheel Tracker test.
- C. Method B: Lime and Aggregate Stockpile Marination:

1. Before introducing hydrated lime, provide sufficient free moisture to thoroughly wet the aggregate and activate the lime.~~Provide sufficient free moisture to thoroughly wet the aggregate and activate the lime.~~
2. Wet cure the aggregate with~~Add~~ lime at a minimum of 1 1/2 %~~percent by weight.~~
3. Thoroughly mix wet aggregate/lime mixture in a twin shaft pugmill.
- ~~3.4. 1.——~~ Marinate the aggregate/lime mixture in the stockpile for~~24a~~ minimum of 48 hours.
5. Quantity (%) (percent) of lime and duration of marination may be adjusted based on results of Hamburg Wheel Tracker test. Adjust quantity (percent) of lime as directed by the Engineer, based on results of Hamburg Wheel Tracker test.
6. Use the wet cured aggregate within 60 days.

- D. Mixing Methods A and B: Provide a horizontal twin shaft pugmill.
1. Adjust mixing paddles in the pugmill so that the aggregate being discharged is completely coated by the lime slurry.
 2. Do not allow volume of material in the pugmill to extend above the vertical position of the blade tips.

3.2 CONTROLLING AND MONITORING

- A. Control the lime batching operation by the Program Logic Control (PLC) System based upon production set up data.
- B. Monitor the following aspects and record on the computer data log printout:
1. Display target and actual rates.
 2. Belt weight bridge for lime.
 3. Locked-in water meter.
 4. Meter to transfer lime slurry.
 5. Closed end loop to mainframe computer.

3.3 QUALITY CONTROL

- A. Tolerance Controls
1. Tolerance lime weight vessel static calibration ± 1.5 percent.
 2. Dynamic delivery calibration ± 1.5 percent.
 3. Inlet flow meter ± 2 percent.
 4. Discharge flow meter ± 1.5 percent.

~~B.——Verification~~

- ~~1.——Submit to the Engineer Post Lottman Data on Hot Mix Asphalt.~~
- ~~2.——Meet the system Tensile Stress Requirement.~~

END OF SECTION

Standards Committee Submittal Sheet

Name of preparer: Craig Haskell/Tim Biel
Title/Position of preparer: Region Three Project Manager/Engineer for Materials
Specification/Drawing/Item Title: Chip Seal
Specification/Drawing Number: 02785

Enter appropriate priority level:

(See last page for explanation) 3

Sheet not required on editorial or minor changes to standards. Check with Standards Section.

NOTES:

1. All Submittal Sheets must be completed and sent to the Standards and Specifications Section by the Standards Committee suspense date as shown on the Web.
(<http://www.udot.utah.gov/index.php/m=c/tid=303>)
2. The Preparer of the Submittal Sheet or the Standards Committee member (or authorized substitute) responsible for the submittal must be present at the Standards Committee meeting and capable of discussing and answering all questions related to the submittal. The item will be postponed to a later meeting if one of these people is not present.
3. Notify the Standards and Specifications Section immediately of any changes that impact the presentation to include absence of sponsor or delay in presentation.

Complete the following: (Use additional pages as needed.)

- A. Why? Detail the reason for changing the Standard (Specification or Drawing), what has initiated a new Standard, or what has caused a new or changed item of interest.

Significant rewrite based on moving to a single base gradation and an optional single size chip gradation. Also changed some of the testing requirements to Contractor.

- B. How is Measurement and Payment handled? Existing (from the measurement and payment document), modified, or new measurement and payment to be included with all Standard Specifications or Supplemental Specifications.

Modifications to pay item will include changing from Type A, B, and C to Type I and II.

- C. Stakeholder Notification for AGC and ACEC:

By email provide the AGC and ACEC Standards Committee member a copy of all pertinent information relating to the specification or drawing. Detail all responses below. Indicate if no comments were received.

Note: There is a two-week response time set for this item.

Refer to the Standards Committee Web site, Members page at <http://www.udot.utah.gov/index.php/m=c/tid=659> for the respective e-mail addresses.

AGC Comments: (Use as much space as necessary.)

See Below

ACEC Comments: (Use as much space as necessary.)

No comments

- D. Stakeholders? From the list provided, document the stakeholders contacted, detailing: the company, name of contact, how contacted (by phone, email, hard copy, or in person), concerns, and comments of the change. Stakeholders:

Note: There is a two-week response time set for this item. Allow Stakeholders two weeks to process and respond to coordination requests. All areas should try to complete review and comment as soon as possible but within two weeks.

In-house (for example, preconstruction, materials, construction, safety, design, maintenance) (Include all applicable in-house areas even if not listed above.)

Desna Bergold, Region Two

Construction Engineers

Karl Verhaeren

Contractors (Any additional contacts beyond "C" above.)

*****Has gone through 3 revisions through Utah Pavement Council, including representatives from Staker-Parsons, Geneva, Granite*****

Suppliers

Rusty Price, ISS

*****Has gone through 3 revisions through Utah Pavement Council, including representatives from Idaho Asphalt and SEM Materials*****

Consultants (as required) (Any additional contacts beyond "C" above.)

FHWA (To be accomplished as part of the two-week process before submitting to the Standards and Specifications Section for inclusion on the Standards Committee agenda.)

(This is in addition to the requirements of UDOT Policy 08A5-1, procedure 08A5-1.3.)

Others (as appropriate)

RME Group approved

- E. Other impacted areas, systems, or personnel. (Consider all impacts and possible changes to these areas during the preparation process. Coordinate with all appropriate areas for the respective item. List all impacts and action taken.)

1. Minimum Sampling and Testing Guide (MS&T Guide)

Changes are currently in the specification under section 1.5. Will be cut and pasted into MS&T with next MS&T update.

2. Business Systems (Electronic Bid System, Project Development Business System, Electronic Program Management, Computer-Aided Drafting and Design, etc.)

Will impact the pay item description

3. Implementation Plan (Provide detailed instructions on how the subject item will be implemented to include notification of all interested parties and training requirements.)

Publishing the specification, notice will be given at Pavement Council.

- F. Costs? (Estimates are acceptable.)

1. Additional costs to average bid item price.

Test projects have not seen a significant increase in unit price.

2. Operational (For example, maintenance, materials, equipment, labor, administrative, programming).

Puts testing onus on the Contractor.

3. Life cycle cost.

Should be significant increase due to elimination of marginal and inconsistent materials.

- G. Benefits? (Provide details that can be used to complete a Cost – Benefit Analysis.) (Estimates are acceptable.) (If no costs, what is the benefit of making this change?)

Less workload and better timing for Region Field personnel.

H. Safety Impacts?

None

I. History? Address issues relating to the current usage of the item and past reviews, approvals, and/or disapprovals.

Have had several test projects. Have had significant inclusion by Industry through Pavement Council. Maintenance is currently reviewing to see if they want to adopt.

Priority Explanation

Enter the appropriate priority in the box on the first page of the document.

Priority 1 Upon posting, this impacts all projects in construction and design with a Change Order, Addenda, and immediate change to projects being advertised.

Priority 2 Upon posting, this impacts projects being advertised.

Priority 3 Upon posting, the approved standard takes effect **four weeks** later for projects being advertised.

**Supplemental Specification
2005 Standard Specification Book**

SECTION 02785

CHIP SEAL COAT

Delete Section 02785 in its entirety and replace with the following:

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Materials and procedures for applying emulsified asphalt, ~~on a cleaned surface~~ followed with an application of cover material and bituminous flush coat.
- B. Cover materials.

1.2 RELATED SECTIONS

- A. Section 01554: Traffic Control
- B. Section 01558: Temporary Pavement Markings
- C. [Section 02742S: Project Specific Surfacing Requirements](#)
- ED. Section 02745: Asphalt Material
- DE. Section 02748: Prime Coat/Tack Coat

1.3 REFERENCES

- ~~A. [AASHTO M 140: Emulsified Asphalt](#)~~
- BA. AASHTO M 208: Cationic Emulsified Asphalt
- ~~C. [AASHTO MP 1: Performance Graded Asphalt Binder](#)~~
- BCD. AASHTO T 11: Materials Finer Than 75 µm (No. 200) Sieve in Mineral Aggregates by Washing

~~ECD.~~ AASHTO T 19: Unit Weight and Voids in Aggregate

~~FDE.~~ AASHTO T 27: Sieve Analysis of Fine and Coarse Aggregates

~~GF.~~ ~~AASHTO T 40: Sampling Bituminous Materials~~

~~HEG.~~ ~~AASHTO T 59: Standard Test Methods for Emulsified Asphalts~~

~~F.~~ AASHTO T 96: Resistance to Abrasion of Small Size Coarse Aggregate by Use of the Los Angeles Machine

~~IHG.~~ AASHTO T 104: Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate

~~HJ.~~ AASHTO T 278: Surface Frictional Properties Using the British Pendulum Tester

~~KIJ.~~ AASHTO T 279: Accelerated Polishing of Aggregates Using the British Wheel

~~JLK.~~ ~~ASTM D 5821~~ ~~AASHTO TP 61~~: Determining the Percentage of Fractured Particles in Coarse Aggregate

~~KML.~~ UDOT Materials Manual of Instruction

~~L.~~ ~~UDOT Minimum Sampling and Testing Requirements~~

~~M.~~ ~~UDOT Quality Management Plan~~

1.4 CONTRACTOR SUBMITTALS

A. Mineral Aggregate

1. Test Reports

a. Cover Material meets requirements of this Section ~~section~~ ~~article~~
2.4.

B. Verification that asphalt/polymer emulsion meets Section 02745

C. Verification that asphalt/polymer supplier adheres to UDOT Quality Management Plan for Asphalt Emulsion 508.

1.5 MINIMUM SAMPLING AND TESTING REQUIREMENTS

~~Quality Assurance for aggregate stockpiles, performed by the Department~~

~~Accept cover material at the source or the project stockpile.~~

~~a. Retest at the project stockpile at engineer's discretion.~~

2. Aggregate stockpile sieve analysis, AASHTO T 2, T 27 / T 11

~~a. One gradation per 500 tons of material (estimated) in stockpile.~~

~~B. Documentation/Report~~

~~1. Verification that asphalt/polymer emulsion supplier adheres to UDOT Minimum Sampling and Testing Requirements Section 508 Asphalt Emulsion Quality Management Plan from the UDOT website. Refer to <http://www.udot.utah.gov/index.php/m=c/tid=719> for dated, signed, qualified list printout.~~

1.56 ACCEPTANCE

~~A. Acceptance sampling and testing of material is in accordance with UDOT Minimum Sampling and Testing Requirements.~~

~~B. Price Adjustments – Cover Material Gradation~~

~~1. Based on the number of samples per lot and the minimum pay factor.~~
~~2. Pay Factors for aggregate gradation when tested in accordance with AASHTO T 27 and AASHTO T 11 are indicated in Table 1.~~

1.4 ACCEPTANCE

~~A. Emulsified Asphalt~~

~~1. Refer to UDOT Materials Manual of Instruction 986, Sampling Chip Seal Emulsions. Do not use dip sampling devices~~

~~a. Provide each delivery truck and/or trailer with a permanently installed sampling valve meeting the requirements of AASHTO T 40.~~

~~1) Waste a minimum of 1 gallon of emulsion before taking each sample.~~

~~2) Take the sample, comprised of two 1 quart plastic containers, in the presence of a UDOT representative.~~

~~b. Alternatively, furnish a detachable valve fitting, meeting the requirements of AASHTO T 40 or similar to UDOT Materials Manual of Instruction 986, figure 1.~~

~~1) Transfer approximately 1/3 of the emulsion from the delivery unit into an empty tank or distributor before using the detachable valve fitting to obtain the sample.~~

~~2) Waste a minimum of 1 gallon of emulsion before taking each sample.~~

~~3) Take the sample, comprised of two 1 quart plastic containers, in the presence of a UDOT representative.~~

~~c. Accumulate and dispose of all sampling waste in accordance with all applicable environmental regulations.~~

- d. Do not place emulsified asphalt prior to verifying ~~ication~~ the respective viscosity test results meet the requirements of Section 02745.

B. Cover Material

1. The Department ~~will~~ ~~samples~~ ~~and tests~~ cover material at the source of supply and/or the project stockpile.
- a. ~~Determine lot size and number of tests in accordance with Table 1.~~
- b. ~~Sample and retest for acceptance at the project stockpile at the Engineer's discretion when material is sampled for acceptance at the source of supply.~~
- c. ~~Determine acceptance and pay factors in accordance with Table 2.~~

Table 1

Lot Quantity* (Tons)	Number of Tests
≥ 2500	5
1500 to 2500	4
≤ 1500	3

* Individual lots may include material from one or more stockpiles.

Table 21

Aggregate Gradation Pay Factors

Sieve Size	Pay Factor*	Type BI Acceptance Band**	Type CI Acceptance Band**
1/2 inch	1.00 0.95 0.90 0.85 Reject		100.0 99.0 98.0 97.0 < 96.9 <u>97.0</u>
3/8 inch	1.00 0.95 0.90 0.85 Reject	<u>100.0</u> <u>99.0</u> <u>98.0</u> <u>97.0</u> < <u>97.0</u>	70.0 - 90.0 69.5 - 91.5 69.2 - 92.0 68.0 - 92.0 < 67.8 <u>90</u> and > 92.4 <u>0</u>
No. 4	1.00 0.95 0.90 0.85 Reject	100.0 <u>0 - 15</u> 99.0 <u>15.1 - 16.0</u> 98.0 <u>16.1 - 17.0</u> 97.0 <u>17.1 - 18.0</u> > <u>18.0</u> < 96.9	0 - 5 <u>10.0</u> 5 <u>10.1 - 5</u> <u>10.5</u> 5 <u>10.6 - 6</u> <u>11.0</u> 6 <u>11.1 - 7</u> <u>12.0</u> > 7.1 <u>12.0</u>
No. 8	1.00 0.95 0.90 0.85 Reject	85.0 <u>100</u> 84.0 <u>84.9</u> 83.0 <u>83.9</u> 82.0 <u>82.9</u> < 81.9	0.0 - 35 <u>0</u> 35.1 <u>35.5</u> 35.6 <u>46.0</u> 46.1 <u>57.0</u> > 5.1 <u>7.0</u>
No. 16	1.00 0.95 0.90 0.85 Reject	10.0 <u>25.0</u> 9.5 <u>25.5</u> 9.0 <u>26.0</u> 8.5 <u>26.5</u> < 8.4 and > 26.6	
No. 50	1.00 0.95 0.90 0.85 Reject	0.0 <u>5.0</u> 5.1 <u>5.5</u> 5.6 <u>6.0</u> 6.1 <u>7.0</u> > 7.1	
No. 200	1.00 0.75 0.50 Reject	0.0 - 21 <u>0</u> 21.1 <u>21.5</u> 21.6 <u>32.0</u> > 32.4 <u>0</u>	0.0 - 1.0 1.1 - 1.5 1.6 - 2.0 > 2.4 <u>0</u>

* Use the lowest individual pay factor for combined gradation

** Average of tests

PART 2 PRODUCTS

~~2.1 PERFORMANCE GRADED PG BINDER - AASHTO MP 1~~

~~A. PG58 22 per Section 02745.~~

~~B. PG64 22 per Section 02745.~~

~~2.2 ANIONIC EMULSIONS~~

~~A. RS 2 per AASHTO M 140.~~

2.31 CATIONIC EMULSIONS - AASHTO M 208

A. CRS-2A per Section 02745.

~~B. CRS 2B per Section 02745.~~

~~CB.~~ CRS-2P per Section 02745.

~~DC.~~ LMCRS-2 per Section 02745.

2.42 HIGH FLOAT EMULSIONS

A. HFRS-2P per Section 02745.

B. HFMS-2 per ~~AASHTO M 140.~~Section 02745.

C. HFMS-2P per Section 02745.

2.53 FLUSH COAT

A. Use ~~one of the following~~ emulsions as designated in Special Provision 02742S,
~~agreed upon by the Engineer, per Section 02745,~~ diluted two parts concentrate to
one part water by the Manufacturer:

~~1. CSS 1~~

~~2. CSS 1h~~

~~3. SS 1~~

~~4. SS 1h~~

~~5. HFMS 2P~~

2.64 COVER MATERIAL

- A. ~~A.~~ Use crusher processed virgin aggregate consisting of natural stone, gravel, or slag meeting the requirements of Table 32.

Table 2

Chip Seal Cover Material Properties		
Unit Weight, see Note 1	AASHTO T 19	100 lb/ft ³ , max
One Fractured Face	AASHTO TP 61	95% min.
Two Fractured Faces	AASHTO TP 61	90% min.
LA wear, see Note 1	AASHTO T 96	30% max.
Soundness	AASHTO T 104	10% max.
Flakiness Index	Material MOI 8-933	17 max.
Stripping, see Note 1	Materials MOI 8-945	10% max.
Polishing, see Note 1 (Performed on aggregate prior to crushing)	AASHTO T 278, T 279	31 min.
Field Coating of Emulsified Asphalt (using project specified emulsion)	AASHTO T 59	Rating of "Good"
Note 1: The Department has the right to waive this requirement if the aggregates have proven acceptable through successful past performance as determined by the Engineer.		

Table 3

- B. Grade with the following limits to meet the specified test standard in AASHTO T 27 and T 11.

Table 43

Gradation Limits		
Sieve Size	Percent Passing	
	Type A Type B1	Type C11
1/2 in	100	100
3/8 in	85-100	70-90
No. 4	0-20	0-510
No. 8	0-5	0-35
No. 16		
No. 50		
No. 200	0-1	0-1
	100	

	0 — 15 <u>100</u> 85 100 10 25 0 5 0 — 1 <u>15</u> <u>0 - 1</u>	
--	--	--

2.75 BLOTTER MATERIAL

A. Refer to Section 02748.

2.86 TEMPORARY PAVEMENT MARKERS

A. ~~A.~~ Refer to Section 01558.

2.7 EQUIPMENT

A. ~~Use Distributor Trucks~~ meeting the following requirements:

1. ~~Distributors equipment will include a~~ Tachometer, pressure gauges, accurate volume measuring devices or a calibrated tank, and a thermometer for measuring temperatures of the tank contents.
2. Insulated tanks capable of storing the binder at temperatures that allow the binder to remain consistent with the appropriate viscosity for proper application rates.
 - a. Use tanks equipped with baffles to prevent pressure surges resulting from the asphalt sloshing in the tank when starting and stopping.
 - b. Use trucks equipped with ~~devices~~ devices to provide for accurate and rapid correlation and control of the amount of bituminous material being applied, with that of the truck or distributor ~~gauges~~ gauges.
- ~~3. Use~~ Constant volume circulation pumps(s) and heaters(s) to maintain a pressurized system so binder will be uniformly heated.
 - a. ~~—~~ Circulation pump must spray a constant volume for the entire length of the spray bar for each application.
- ~~4. Use~~ s—Spray bar and nozzles designed to provide an appropriate fan width to ~~ensure~~ provide uniform transverse distribution, without corrugation or streaking.
 - a. ~~—~~ Adjust the spray bar height to ~~height which~~ height that ~~ensures~~ provide uniform distribution of binder across the application width and triple lapping of the binder on the pavement surface.

- a. Inflate tires to 90 lb/in² pounds per square inch, or lower as approved by the Engineer.
 - 1) Maintain tire pressure within 5 lb/in² pounds per square inch.
- E. Sweeping equipment
 - 1. Use rotary brooms with nylon or steel bristles or, pickup or vacuum brooms for pavement cleaning or brooming operations.
 - a. Keep downward pressure to a minimum
 - b. Use water as requested by the Engineer if excessive dust is generated during sweeping operations.
 - c. Use pickup or vacuum sweepers in urban areas where aggregate accumulates in gutters or where removal is required ~~undesireable~~undesirable from the edge of the shoulder.
 - d. ~~When brooming chip sealed roadway, d~~Do not dislodge embedded aggregate when brooming chip sealed roadway.
- F. Blotter Material Equipment
 - 1. Apply blotter material by means of a truck mounted spinner broadcast spreader or other equipment as approved by the Engineer.
- G. All equipment is subject to inspection and approval by the Engineer.

PART 3 EXECUTION

3.1 PREPARATION

- A. Clean the road surface of all dirt, sand, dust, and other objectionable material to the satisfaction of the Engineer.
- B. Protect all structures, ~~from being spattered or marred~~ including guardrail, guideposts, concrete barriers, parapet walls, etc.
- C. Cover manholes, valve boxes, drop inlets and other service utility entrances before placing any chip seal coat.
- D. Stockpile blotter material, a minimum of 0.25 lb/yr² lbs./square yard meeting the requirements of Section 02748 at a site within twenty minutes delivery time of each road section being chip sealed, and have on site application equipment before beginning chip seal work.
 - 1. Upon Engineer approval, stockpiling of blotter material may be waived if blotter material can be obtained and ready to spread within twenty minutes of a road section being chip sealed.

2. Equipment to spread blotter material is subject to inspection and approval by the Engineer.

3.2 LIMITATIONS

- A. Complete all work between May 15 and August 31.
- B. ~~Provide a minimum of 0.5 lbs/yd² blotter material meeting the requirements of Section 02748 and application equipment at the project site prior to beginning seal coat work. Application equipment is subject to inspection and approval by the Engineer.~~
- ~~C.~~ Do not place ~~any~~ chip seal coat if ~~surface~~ the Engineer determines that excess moisture is present ~~in the pavement structure.~~
- ~~DC.~~ Place seal coat when:
1. Pavement temperature is between 70 degrees F and 136 degrees F.
 2. Air temperature is between 75 and 110 degrees F. ~~and rising in the shade.~~
 3. Forecasted temperature is not expected to be below 40 degrees F within 3 days after placement.
- ~~ED.~~ Do not apply any bituminous asphalt after 6:00 p.m. i ~~Complete all chip seal operations, including sweeping, during daylight hours. f~~ temperatures in this Section, article 3.2: paragraph C can not ~~can't~~ be maintained throughout all night time hours.
- ~~FE.~~ On interstate routes, do not open to traffic the same day chip seal coat is placed.
1. Sweep and open to traffic no earlier than 14 hours after placing cover material.
- ~~GF.~~ Apply b ~~Apply~~ bituminous flush coat material after receiving approval from the Engineer, but no ~~no~~ earlier than 48 hours ~~14 days~~ after the ~~the~~ application of the cover material. ~~or as directed by the Engineer.~~
1. Apply bituminous flush coat material when the air temperature in the shade is 50 degrees F and rising, and the pavement temperature is 70 degrees F and rising.
 2. Do not apply bituminous flush coat material during fog, rain, or other adverse conditions.

3.3 COVER MATERIAL STOCKPILE

- A. Construct on a clean base area ~~to~~ minimize contamination.

- B. Construct to facilitate uniform dampening. Avoid excess moisture.

3.4 TEMPORARY PAVEMENT MARKER APPLICATION

- A. Refer to Section 01558.

3.5 ASPHALT MATERIAL /COVER MATERIAL APPLICATION

- A. ~~Use a distributor equipped with a hydrostatic system capable of maintaining a tolerance of ± 0.03 gal/yd².~~

- ~~1. Apply asphalt material at a rate sufficient to obtain 50 percent chip embedment before the rolling operation, and 70 percent chip embedment after rolling operation.~~

- ~~21. Adjust Application rates ~~may vary~~ throughout the project depending on existing conditions.~~

- ~~3. Equipment is subject to inspection and approval by the Engineer.~~

- B. Apply the asphalt emulsion at a minimum temperature of 145 degrees F.

- C. Do not apply asphalt material if any of the following conditions apply:

1. Material does not meet the required viscosity.

2. Material does not spray through the distributor in a uniform way and remain in place on the roadway.

- ~~CD.~~ Place building paper adjacent to the transverse construction joint ~~before~~ prior to starting each spraying operation.

- ~~1.~~ Maintain the control valve to act instantaneously, both ~~in at~~ start-up and cut- ~~off~~.

- ~~DE.~~ Locate longitudinal joints within 6 inches of the traffic lane line location.

- ~~1.~~ Construct meet lines with no skip or voids between adjacent passes.

- ~~2.~~ Do not place a double thickness of cover material.

- ~~EF.~~ ~~Spread the cover material maintaining a tolerance of ± 1.0 lb/yd².~~

- ~~1. Equipment is subject to inspection and approval by the Engineer.~~

- ~~F.~~ Calibrate the spreader at the beginning of each day and as often as necessary to comply with required. See TTable 54.

1. Maintain a distance of less ~~no more than~~ 150 ft² between the distributor and the chip spreader.

2. Maintain the ~~Keep the speed of the chip spreader~~ speed such that chips do not ~~at a level which doesn't cause chips to~~ bounce or roll upon application into asphalt material.

|

|

Table 54

Approximate Spread Rates	
Unit Weight lbs/ft ³	Application Rate lbs/yd ²
60 - 65	17.0
65 - 70	18.4
70 - 75	19.8
75 - 80	20.7
80 - 85	22.1
85 - 90	23.5
90 - 95	24.9
95 - 100	25.8
<u>95 - 100</u>	<u>25.8</u>

- ~~1. Maintain a distance of no more than 150' between the distributor and the chip spreader.~~
- ~~2. Keep the speed of the chip spreader at a level which doesn't cause chips to bounce or roll upon application into asphalt material.~~

~~GF. Submit all documentation verifying asphalt application rates, chip application, and other calibration verification for applied materials during the chip seal operations to the Engineer on a daily basis, or as requested by the Engineer.~~

3.6 SURFACE ROLLING

- A. Use a minimum of ~~three two~~ pneumatic-tire rollers in a longitudinal direction to roll surface after the cover material has been spread.
- B. Use a minimum of three passes to seat the cover material.
 1. A pass is defined as traveling in one direction only.
~~Two passes is rolling forward and back.~~
- C. Control bleeding with blotter material and as directed by the Engineer.
- D. Set the roller speed to prevent bouncing or skidding, ~~but never greater than~~ not to exceed 5 mph.
 1. Reduce roller speeds during directional changes to prevent tearing of the surface.
 2. Repair all damage done to the seal coat by the rollers.

- E. Synchronize the speed of the distributor and chip spreader with that of the rolling operation.
 - 1. Begin initial rolling, consisting of one complete coverage, immediately behind the chip spreader.
 - 2. Begin secondary rolling, consisting of second and third coverage, immediately after completing initial rolling.
 - 3. Synchronize all operations to keep rolling operations within 2500 feet of the ongoing chip seal application.
- F. Sweep excess cover material off the roadway after the emulsion has set.
 - 1. Remove excess cover material to the satisfaction of the Engineer before opening the roadway to traffic.

3.7 BITUMINOUS FLUSH COAT APPLICATION

- A. Clean the surface of all dirt, sand, dust, loose chips, and other objectionable material to the satisfaction of the Engineer before applying bituminous flush coat.
- B. Apply the bituminous flush coat at a rate of 0.11, plus or minus 0.01 gal/yd².
 - 1. Keep traffic off the flushed surface until the bituminous material has set sufficiently to prevent tracking or pick-up.
 - 2. Allow a minimum of 24 hours before applying permanent application of traffic striping or markings after completing flush seal.
- C. Provide vendor's bill of lading certifying the material was diluted in accordance with this Section, article 2.53.

3.8 TRAFFIC CONTROL

- A. Refer to Section 01554.

END OF SECTION

Standards Committee Submittal Sheet

Name of preparer: John Butterfield/Tim Biel
Title/Position of preparer: Region Two Materials Engineer/Engineer for Materials
Specification/Drawing/Item Title: Flowable Fill
Specification/Drawing Number: 03575

Enter appropriate priority level:

(See last page for explanation) 3

Sheet not required on editorial or minor changes to standards. Check with Standards Section.

NOTES:

1. All Submittal Sheets must be completed and sent to the Standards and Specifications Section by the Standards Committee suspense date as shown on the Web.
(<http://www.udot.utah.gov/index.php/m=c/tid=303>)
2. The Preparer of the Submittal Sheet or the Standards Committee member (or authorized substitute) responsible for the submittal must be present at the Standards Committee meeting and capable of discussing and answering all questions related to the submittal. The item will be postponed to a later meeting if one of these people is not present.
3. Notify the Standards and Specifications Section immediately of any changes that impact the presentation to include absence of sponsor or delay in presentation.

Complete the following: (Use additional pages as needed.)

- A. Why? Detail the reason for changing the Standard (Specification or Drawing), what has initiated a new Standard, or what has caused a new or changed item of interest.

Minor changes including allowing the use of blended cements and removing the requirement for Department personnel to witness the trial batch.

- B. How is Measurement and Payment handled? Existing (from the measurement and payment document), modified, or new measurement and payment to be included with all Standard Specifications or Supplemental Specifications.

No Change

- C. Stakeholder Notification for AGC and ACEC:

By email provide the AGC and ACEC Standards Committee member a copy of all pertinent information relating to the specification or drawing. Detail all responses below. Indicate if no comments were received.

Note: There is a two-week response time set for this item.

Refer to the Standards Committee Web site, Members page at

<http://www.udot.utah.gov/index.php/m=c/tid=659> for the respective e-mail addresses.

AGC Comments: (Use as much space as necessary.)

No comments

ACEC Comments: (Use as much space as necessary.)

No comments

- D. Stakeholders? From the list provided, document the stakeholders contacted, detailing: the company, name of contact, how contacted (by phone, email, hard copy, or in person), concerns, and comments of the change. Stakeholders:

Note: There is a two-week response time set for this item. Allow Stakeholders two weeks to process and respond to coordination requests. All areas should try to complete review and comment as soon as possible but within two weeks.

In-house (for example, preconstruction, materials, construction, safety, design, maintenance) (Include all applicable in-house areas even if not listed above.)

Construction Engineers

Karl Verhaeren

Contractors (Any additional contacts beyond “C” above.)

No additional comments

Suppliers

Supported by Todd Laker (Holcim) and Ben Blankenship (Ashgrove)

Consultants (as required) (Any additional contacts beyond “C” above.)

FHWA (To be accomplished as part of the two-week process before submitting to the Standards and Specifications Section for inclusion on the Standards Committee agenda.) (This is in addition to the requirements of UDOT Policy 08A5-1, procedure 08A5-1.3.)

Others (as appropriate)

RME Group approved

E. Other impacted areas, systems, or personnel. (Consider all impacts and possible changes to these areas during the preparation process. Coordinate with all appropriate areas for the respective item. List all impacts and action taken.)

1. Minimum Sampling and Testing Guide (MS&T Guide)

No impact

2. Business Systems (Electronic Bid System, Project Development Business System, Electronic Program Management, Computer-Aided Drafting and Design, etc.)

No impact

3. Implementation Plan (Provide detailed instructions on how the subject item will be implemented to include notification of all interested parties and training requirements.)

In addition to publishing the specification, notice will be given to PCC suppliers as they request review of trial batches.

F. Costs? (Estimates are acceptable.)

1. Additional costs to average bid item price.

None, maybe a slight reduction in using blended cements.

2. Operational (For example, maintenance, materials, equipment, labor, administrative, programming).

None

3. Life cycle cost.

None

G. Benefits? (Provide details that can be used to complete a Cost – Benefit Analysis.) (Estimates are acceptable.) (If no costs, what is the benefit of making this change?)

Less workload and better timing for Region Lab personnel, possibly cheaper PCC based on using blended cements.

H. Safety Impacts?

None

- I. History? Address issues relating to the current usage of the item and past reviews, approvals, and/or disapprovals.

None

Priority Explanation

Enter the appropriate priority in the box on the first page of the document.

- | | |
|------------|---|
| Priority 1 | Upon posting, this impacts all projects in construction and design with a Change Order, Addenda, and immediate change to projects being advertised. |
| Priority 2 | Upon posting, this impacts projects being advertised. |
| Priority 3 | Upon posting, the approved standard takes effect four weeks later for projects being advertised. |

**Supplemental Specification
2005 Standard Specification Book**

SECTION 03575

FLOWABLE FILL

Delete Section 03575 and replace with the following:

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Materials and procedures for placing flowable fill.

1.2 ~~REFERENCES~~RELATED SECTIONS

- A. Section 03055: Portland Cement Concrete

1.3 REFERENCES

- A. AASHTO M 154: Air-Entraining Admixtures for Concrete
- B. AASHTO M 194: Chemical Admixture for Concrete
- ~~C. ASTM C 150: Portland Cement~~
- ~~D. ASTM C 618: Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete~~
- E.C. ASTM D 4832: Preparation and Testing of Controlled Low Strength Material (CLSM) Test

1.4 SUBMITTALS

- A. Batch Proportions: Submit to Engineer seven days before placement.
- B. Trial Batch:
 - 1. Submit certified test results or conduct laboratory trial batch to verify strength prior to placement.
 - ~~2. The Department or its representative witnesses the trial batch.~~

PART 2 PRODUCTS

2.1 MATERIALS

- A. ~~Portland~~ Cement: ~~ASTM C 150~~ Refer to Section 03055 Portland Cement Concrete.
- B. Pozzolan: Refer to Section 03055 Portland Cement Concrete ~~ASTM C 618.~~
- C. Sand.
- D. Coarse aggregate: Determine a suitable aggregate size and gradation for the intended application.
- E. Admixtures:
 - 1. Water reducers and set accelerators: AASHTO M 194.
 - 2. Air entrainment: AASHTO M 154.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Combine materials to meet the requirements for strength and constructability as required. Determine strength from trial batches at 28 days.
 - 1. Minimum strength: 50 psi. ASTM D 4832.
 - 2. Maximum strength: 150 psi. ASTM D 4832.
 - 3. Slump: 5 inches to 10 inches.
- B. Determine a suitable aggregate size and gradation for the intended application.

END OF SECTION

Standards Committee Submittal Sheet

Name of preparer: Ming Ming Jiang

Title/Position of preparer: CE III, Design Engineer, Structures

Specification/Drawing/Item Title: Updates Section 02221 Remove Structure and Obstruction
Updates Section 02225 Asphalt Surfacing Removal
(Structures)

Specification/Drawing Number:

Enter appropriate priority level:

(See last page for explanation)

4

---With New Book

Sheet not required on editorial or minor changes to standards. Check with Standards Section.

NOTES:

1. All Submittal Sheets must be completed and sent to the Standards and Specifications Section by the Standards Committee suspense date as shown on the Web.
(<http://www.udot.utah.gov/index.php/m=c/tid=303>)
2. The Preparer of the Submittal Sheet or the Standards Committee member (or authorized substitute) responsible for the submittal must be present at the Standards Committee meeting and capable of discussing and answering all questions related to the submittal. The item will be postponed to a later meeting if one of these people is not present.
3. Notify the Standards and Specifications Section immediately of any changes that impact the presentation to include absence of sponsor or delay in presentation.

Complete the following: (Use additional pages as needed.)

- A. Why? Detail the reason for changing the Standard (Specification or Drawing), what has initiated a new Standard, or what has caused a new or changed item of interest.

These are updates & revisions to existing specifications

Sections include:

Section 02221 Remove Structure and Obstruction

Section 02225 Asphalt Surfacing Removal (Structures)

- B. How is Measurement and Payment handled? Existing (from the measurement and payment document), modified, or new measurement and payment to be included with all Standard Specifications or Supplemental Specifications.

As follows:

Add the following:

(Section 02221: Remove Structure and Obstruction)

	022210170	Remove Concrete Slope Protection	SQ. YD.
--	-----------	----------------------------------	---------

(Section 02225: Asphalt Surfacing Removal (Structures))

	022250010	Asphalt Surfacing Removal (Structures)	SQ. YD.
--	-----------	--	---------

C. Stakeholder Notification for AGC and ACEC:

By email provide the AGC and ACEC Standards Committee member a copy of all pertinent information relating to the specification or drawing. Detail all responses below. Indicate if no comments were received.

Note: There is a two-week response time set for this item.

Refer to the Standards Committee Web site, Members page at <http://www.udot.utah.gov/index.php/m=c/tid=659> for the respective e-mail addresses.

AGC Comments: (Use as much space as necessary.)

Sent to Mont Wilson (Granite) on March 15, 2007 for review and comment.

Comments requested by March 30, 2007.

ACEC Comments: (Use as much space as necessary.)

Sent to ACEC on Mach 15, 2007 for review and comment.

Comments requested by March 30, 2007.

D. Stakeholders? From the list provided, document the stakeholders contacted, detailing: the company, name of contact, how contacted (by phone, email, hard copy, or in person), concerns, and comments of the change. Stakeholders:

Note: There is a two-week response time set for this item. Allow Stakeholders two weeks to process and respond to coordination requests. All areas should try to complete review and comment as soon as possible but within two weeks.

In-house (for example, preconstruction, materials, construction, safety, design, maintenance) (Include all applicable in-house areas even if not listed above.)

District Engineers

Sent to District Engineers on March 15, 2007 for review and comment.

Comments requested by March 30, 2007.

Dennis Simper (R1)

No Commen

Rob Wight (R2)

Phoned No Comment

Scott Andrus (R3 west)

Phoned No Comment

Bob Westover (R3 east)

Phoned No Comment

Robert Dowell (R4 richfield)

Phoned No Comment

Scott Munson (R4 Cedar)

Phoned No Comment

Hugh Kirkham (R4 Price)

Phoned No Comment

Karl Verhaeren (Central)

Comments

Preconstruction Engineers

Sent to Preconstruction Engineers on March 15, 2007 for review and comment.

Comments requested by March 30, 2007.

Rex Harris (R1)

Phoned No Comment

Bill Lawrence (R2)

Comment

Brent Schvaneveldt (R3)

Phoned No Comment

Mike Miles (R4)

Phoned No Comment

Robert Miles (Central)

Comment

Region Materials Engineer

Sent to Region Materials Engineers on March 15, 2007 for review and comment.

Comments requested by March 30, 2007.

Rodney Terry (R1)

Phoned No Comment

John Butterfield (R2)

Comments

Jim Cox (R3)

No Comment

Larry Gay (R4)

Phoned No Comment

Tim Biel (Central)

Phoned No Comment

Contractors (Any additional contacts beyond "C" above.)

Suppliers

Consultants (as required) (Any additional contacts beyond "C" above.)

FHWA (To be accomplished as part of the two-week process before submitting to the Standards and Specifications Section for inclusion on the Standards Committee agenda.)

(This is in addition to the requirements of UDOT Policy 08A5-1, procedure 08A5-1.3.)

Sent to FHWA on March 15, 2007 for review and comment.

Comments requested by March 30, 2007.

Russ Robertson

No Respond

Anthony Sarhan

No Respond

Others (as appropriate)

Sent to all member of the Standards committee on March 15, 2007 for review and comment.

Comments requested by March 30, 2007.

Jim McMinimee

No Respond

Robert Miles

Comment

Randy Park

No Respond

Rex Harris

Phoned No Comment

Karl Verhaeren	<u>Comments</u>	
Richard Clarke		No Respond
Robert Hull		No Respond
Tim Biel	<i>Phoned</i> <u>No Comment</u>	
Stan Burns		No Respond
Boyd Wheeler		No Respond
Erik Brondum		No Respond
Barry Axelrod	<u>Comments</u>	
Shana Lindsey	<u>No Comment</u>	
Anthony Sarhan	<u>No Comment</u>	
Mont Wilson		No Respond
Tyler Yorgason	<u>Comments</u>	
Kevin Griffin (R1)		No Respond
Betty Purdie (R2)		No Respond

E. Other impacted areas, systems, or personnel. (Consider all impacts and possible changes to these areas during the preparation process. Coordinate with all appropriate areas for the respective item. List all impacts and action taken.)

1. Minimum Sampling and Testing Guide (MS&T Guide)
N/A
2. Business Systems (Electronic Bid System, Project Development Business System, Electronic Program Management, Computer-Aided Drafting and Design, etc.)
N/A
3. Implementation Plan (Provide detailed instructions on how the subject item will be implemented to include notification of all interested parties and training requirements.)
N/A

F. Costs? (Estimates are acceptable.)

1. Additional costs to average bid item price.
N/A
2. Operational (For example, maintenance, materials, equipment, labor, administrative, programming).
N/A
3. Life cycle cost.
N/A

G. Benefits? (Provide details that can be used to complete a Cost – Benefit Analysis.)
(Estimates are acceptable.) (If no costs, what is the benefit of making this change?)

No cost change. The benefit of the change is to reduce unnecessary Special Provision Sections.

H. Safety Impacts?
N/A

I. History? Address issues relating to the current usage of the item and past reviews, approvals, and/or disapprovals.
N/A

Priority Explanation

Enter the appropriate priority in the box on the first page of the document.

Priority 1 Upon posting, this impacts all projects in construction and design with a Change Order, Addenda, and immediate change to projects being advertised.

Priority 2 Upon posting, this impacts projects being advertised.

Priority 3 Upon posting, the approved standard takes effect **four weeks** later for projects being advertised.

SECTION 02221

REMOVE STRUCTURE AND OBSTRUCTION

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Remove, dispose of, or salvage buildings, fences, structures, pavements, curb, gutter, driveways and approaches, sidewalk and similar hard surfaces, abandoned pipelines or utility items and other obstructions that interfere with construction on or off the site including, but not limited to, foundations, bridges, culverts, guardrail, concrete work, septic tanks, trees, etc.
- B. Salvage as specified, or dispose of in an approved manner.

1.2 RELATED SECTIONS

- A. Section 00727: Control of Work
- B. Section 01355: Environmental Protection
- C. Section 02056: Common Fill
- D. Section 02231: Site Clearing and Grubbing (Note from Standards: Added here but not in body of Section. Add or remove here.)
- E. Section 02705: Pavement Cutting
- F. Section 03055: Portland Cement Concrete

1.3 PROJECT/SITE CONDITIONS

- A. Protect adjacent structures and utilities and their contents that are designated to remain.

PART 2 PRODUCTS

2.1 CONCRETE

- A. Use Class A Concrete. Refer to Section 03055.

2.2 COMMON FILL

- A. Refer to Section 02056.

PART 3 EXECUTION

3.1 PREPARATION

- A. Review all work procedures with Engineer.
- B. Coordinate utility location in accordance with Section 00727.
 - 1. Locate and protect all active utilities.
 - 2. Before beginning work:
 - a. Notify Engineer.
 - b. Notify all affected utilities.
 - c. Blue Stake the area.
- C. Restore utility services disturbed by construction operations.
- D. Disconnect water service by excavating to the corporation stop and turning it off. Disconnect the service line from the corporation stop.
- E. Plug disconnected storm drains or sewer lines near the right-of-way line with a watertight concrete plug extending at least 2.0 ft into the remaining pipe. (From Standards: Is this accuracy needed? Same in 3.3, 3.4 , 3.5, 3.7, 3.8, 3.9, 3.11, 3.12, 3.14, 3.16, and 3.17.)
- F. Remove existing septic tanks, cesspools, leach lines, etc.
- G. All materials not designated for use or salvage become the property of the Contractor unless owned by a utility company.
- H. Excavate all material necessary to permit removal of structure.

3.2 BACKFILL AND COMPACTION

- A. Fill all holes or pits resulting from removal operations with suitable material.
- B. Compact the backfilled areas to the density of the surrounding ground, or as specified.
- C. Department will pay separately for material used for backfilling as "Roadway Excavation," or "Borrow." If no appropriate material item is included in the bid proposal, it will be considered incidental to the work.

3.3 REMOVAL AND DISPOSAL

- A. Remove and dispose of all material promptly using methods acceptable to the Engineer and in accordance with all applicable rules and regulations.
 - 1. Include all excavation, removal, transportation and disposal costs in the item of work.
- B. Repair any damage to adjacent area at no additional cost to Department.
- C. Remove all concrete to at least 2.0 ft below the finished grade, or 2.0 ft below the natural ground surface, whichever is lower.
- D. Obtain all required permits and provide an environmentally safe area for disposal of removed items. Refer to Section 01355.
- E. Dispose of removed obstructions at a site secured by the Contractor. Furnish the Engineer with a copy of the disposal permits or agreements.

3.4 BUILDING, BASEMENT, AND FOUNDATION DEMOLITION

- A. Move or demolish designated buildings including basements, foundations, sidewalks, pavement slabs, porches, fences and outbuildings on each parcel.
- B. The Department is not responsible for any vandalism or theft that occurs to the building or its contents that reduces the value of the salvage or increases the cost of removal after the award of the Contract.
- C. Break the floor into pieces not over 3.0 ft² in areas to remain in place. Remove and dispose of pieces over 3.0 ft².

3.5 BRIDGE, BOX CULVERT DEMOLITION

- A. Arrange detours for traffic flow according to traffic control plans.
- B. Excavate all material necessary to permit removing structure.
- C. Remove structure so that no remaining portion is closer than 3.0 ft to any watercourse or closer than 2.0 ft to the subgrade and embankment surface or within 2.0 ft of the natural ground surface.
- D. Remove all structures that will interfere with proposed construction.
- E. Complete blasting or other removal operations of existing structure that may damage new construction before placing the new work.

3.6 REMOVE CONCRETE SLOPE PROTECTION (Note from Standards: Article 3.6 is all new.)

- A. Remove portions of the existing slope protection and the cutoff wall where required.
- B. ~~The Obtain the~~ Engineer's ~~approves approval~~ limits of the concrete slope protection removal limits.
- C. Saw cut the existing slope protection to full depth.
- D. Do not damage the portions of concrete slope protection that are to remain.
- E. Dispose of the removed material in an environmentally safe area.

3.7 MANHOLE, CLEANOUT, DIVERSION, AND CATCH BASIN REMOVAL

- A. Maintain satisfactory by-pass service during construction operations.
- B. Plug unused sewers with a 2.0 ft long concrete plug.

3.8 CATTLE GUARD REMOVAL

- A. Remove the cattle guard to at least 2.0 ft below the subgrade surface.
- B. Excess materials become the Contractor's property, unless otherwise designated.

3.9 SEPTIC TANK, UNDERGROUND TANK REMOVAL

- A. Empty and dispose of tank contents in accordance with Section 01355.
- | B. Break down and remove tank and appurtenances to at least 2.0 ft below the subgrade surface or finished ground lines.
- C. Break the floor into pieces not over 3 ft² in area.

3.10 BURIED FUEL TANK DEMOLITION

- A. Remove buried fuel storage tanks and dispose of tank contents in accordance with all applicable Laws and Regulations.
- B. Do not spill fuel on subgrade.
- C. Comply with the State and local authorities having jurisdiction over fuel tank removals.

3.11 GUARDRAIL REMOVAL

- A. Remove and dispose of guardrail, posts, hardware, anchor assemblies, terminal assemblies, and attached posts, signs, and delineators.
- | B. For steel posts, remove to a minimum of 8.0 inches below the subgrade surface or finished ground lines.

3.12 FENCE REMOVAL

- A. Prevent people or livestock from entering work site from adjacent properties during removal and installation procedures.
- | B. Remove fence, posts, and foundations to at least 2.0 ft below subgrade or finished ground lines.
- C. Do not damage vegetation and ground cover during removal operations.

3.13 RAILROAD TRACK REMOVAL

- A. Remove all rails, ties, paving, track encasement, and other appurtenances.
- B. Leave crushed stone or gravel ballast. Grade as required.

3.14 TREE REMOVAL

- A. Remove all trees with a circumference larger than 20 inches measured at a point 2.0 ft above existing ground.
 - 1. A tree consists of stump, root, trunk, branches, and foliage.
 - 2. Multiple leaders rising from a common root will not be counted separately.
 - 3. Remove the root system to a minimum depth of 2.0 ft below the finished ground level and within a 2.0 ft radius of the stump.
 - 4. When there is no bid item included in the proposal for "Tree Removal:"
 - a. This work is considered incidental to other items of work and no separate measurement or payment will be made.
 - b. Include all costs in other items of work.
- B. Trees removed with a circumference 20 inches or less, measured at 2.0 ft above existing ground are considered incidental construction.

3.15 CONCRETE HEADWALL REMOVAL

- A. Remove headwalls where designated.
- B. Replace pipes or structural plate pipes damaged while removing headwall at no additional cost to the Department.

3.16 UTILITY POLE REMOVAL

- A. Remove pole and all appurtenances.
- B. Remove foundation to at least 2.0 ft below subgrade or natural ground.

3.17 PIPE CULVERT REMOVAL

- A. Excavate all material necessary to permit removing pipe culvert, end sections, headwalls, etc.
- B. Plugs:
 - 1. Cut existing pipe culvert 2.0 ft inside the Department's right-of-way, and abandon culvert located on private property.

- 2. Plug disconnected pipelines near the right-of-way line with a water-tight concrete plug extending into the remaining pipe at least 2.0 ft.
- C. Seal openings in walls of remaining manholes or catch basins with watertight concrete plug.

3.18 PAVEMENT REMOVAL

- A. Cut existing pavement on the designated lines with straight vertical edges free from irregularities when joining new construction to existing pavement. Refer to Section 02705.
- B. Completely remove pavement down to the underlying base course or subgrade.

3.19 OBLITERATE ROAD

- A. Break up pavement into pieces not over 1 ft² in area. Scarify and cover broken concrete with at least 1 ft of suitable backfill material.
- B. Fill depressions and form rounded slopes to blend with the natural or surrounding contours.
- C. Grade materials either along the toe of an embankment or into a depression or borrow pit. Cover with at least 1 ft of suitable backfill material.

3.20 CONCRETE SIDEWALK, CONCRETE DRIVEWAY REMOVAL

- A. Remove concrete to the nearest expansion joint or saw cut to provide proper grades and connections.
- B. Make concrete cuts straight, vertical to the surface, full depth, and free from irregularities. Refer to Section 02705.
- C. Do not damage concrete designated to remain.

3.21 CONCRETE CURB, CONCRETE CURB AND GUTTER, RAISED ISLAND, BITUMINOUS CURB REMOVAL

- A. Remove curb, curb and gutter, gutters, raised island, bituminous curb, and parts of such improvements to an existing joint or joint sawed with a vertical face.
- B. Remove material to provide proper grades and connections.

3.22 SALVAGE

- A. Salvage designated equipment and materials.
- B. All other materials become the property of the Contractor unless otherwise noted.

END OF SECTION

SECTION 02225

ASPHALT SURFACING REMOVAL (STRUCTURES)

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Remove existing asphalt surfacing materials from deck and approach slabs.

1.2 RELATED SECTIONS

- A. Section 02231: Clearing and Grubbing.

PART 2 PRODUCTS

2.1 REMOVAL EQUIPMENT (Note from Standards: Article rewritten.)

- A. For full-depth removal, use equipment capable of removing the full depth of asphalt on the deck and the approach slabs without damaging the underlying concrete surfaces or Bridge Superstructure.
- B. For partial-depth removal, use equipment capable of removing a uniform thickness of asphalt from the deck and the approach slabs without damaging the underlying asphalt, waterproofing membrane, and concrete surfaces.

PART 3 EXECUTION

3.1 FULL DEPTH REMOVAL (Note from Standards: Article 3.1 name changed and rewritten.)

- A. Remove asphalt as specified.
- B. Remove any existing waterproofing membrane from the deck and/or concrete approach slabs.

3.2 PARTIAL DEPTH REMOVAL

- A. Remove a uniform thickness of asphalt from the deck and approach slabs without damaging the underlying asphalt, waterproofing membrane, or concrete surfaces.
 - 1. Refer to the plans for the asphalt surfacing removal depth.
 - 2. Allow no traffic on the asphalt surface after partial depth removal. Return traffic only after placing the final surfacing.

B. Use equipment that weighs less than 22 tons. (Note from Standards: Embedded note from Tyler Yorgason.) Tyler's comments: Is there any similar weight requirement that should be added under article 3.1 above for the full depth removal?

3.3 ASPHALT DISPOSAL (Note from Standards: Article 3.3 is all new.)

- A. Dispose of ~~Asphalt~~ asphalt per Section: 02231

END OF SECTION

Standards Committee Submittal Sheet

Name of preparer: David Deng
Title/Position of preparer: CE III, Design Engineer, Structures
Specification/Drawing/Item Title: New Section 02982 Bridge Concrete Grinding
New Section 03339 Precast Concrete Deck Panel
Specification/Drawing Number:

Enter appropriate priority level: With new book
(See last page for explanation) 4

Sheet not required on editorial or minor changes to standards. Check with Standards Section.

NOTES:

1. All Submittal Sheets must be completed and sent to the Standards and Specifications Section by the Standards Committee suspense date as shown on the Web.
(<http://www.udot.utah.gov/index.php/m=c/tid=303>)
2. The Preparer of the Submittal Sheet or the Standards Committee member (or authorized substitute) responsible for the submittal must be present at the Standards Committee meeting and capable of discussing and answering all questions related to the submittal. The item will be postponed to a later meeting if one of these people is not present.
3. Notify the Standards and Specifications Section immediately of any changes that impact the presentation to include absence of sponsor or delay in presentation.

Complete the following: (Use additional pages as needed.)

- A. Why? Detail the reason for changing the Standard (Specification or Drawing), what has initiated a new Standard, or what has caused a new or changed item of interest.

To meet the Department's Strategic Direction, there is a need of having new specifications for prefabricated bridge elements on structures. The prefabricated methods will improve quality, safety, and reduce traffic impact to the traveling public. New Sections include:

**Section 02982 Bridge Concrete Grinding
Section 03339 Precast Concrete Deck Panel**

- B. How is Measurement and Payment handled? Existing (from the measurement and payment document), modified, or new measurement and payment to be included with all Standard Specifications or Supplemental Specifications.

Add new Measurement and Payment for new Sections, as following:

(Section 02982: Bridge Concrete Grinding)

	029820000	Bridge Concrete Grinding	SQ. YD.
--	-----------	--------------------------	---------

(Section 03339: Precast Concrete Deck Panel)

	033390000	Precast Concrete Deck Panel	Lump
--	-----------	-----------------------------	------

C. Stakeholder Notification for AGC and ACEC:

By email provide the AGC and ACEC Standards Committee member a copy of all pertinent information relating to the specification or drawing. Detail all responses below. Indicate if no comments were received.

Note: There is a two-week response time set for this item.

Refer to the Standards Committee Web site, Members page at <http://www.udot.utah.gov/index.php/m=c/tid=659> for the respective e-mail addresses.

AGC Comments: (Use as much space as necessary.)

Sent to Mont Wilson, Granite Construction on March 15, 2007 for review and comment.

Comments requested by March 30, 2007. ----- (No comments received)

ACEC Comments: (Use as much space as necessary.)

Sent to Tyler Yorgason, Civil Science on March 15, 2007 for review and comment.

Comments requested by March 30, 2007. ----- (Replied with few comments)

D. Stakeholders? From the list provided, document the stakeholders contacted, detailing: the company, name of contact, how contacted (by phone, email, hard copy, or in person), concerns, and comments of the change. Stakeholders:

Note: There is a two-week response time set for this item. Allow Stakeholders two weeks to process and respond to coordination requests. All areas should try to complete review and comment as soon as possible but within two weeks.

In-house (for example, preconstruction, materials, construction, safety, design, maintenance) (Include all applicable in-house areas even if not listed above.)

Preconstruction Engineers -- Comments requested by March 30, 2007.

Sent to Preconstruction Engineers on March 15, 2007 for review and comment.

Robert Miles, Complex ----- (Replied with minor modifications)

Rex Harris, R1 ----- (Phoned, No comments)

Bill Lawrence, R2----- (Phoned, No comments)

Brent Schvaneveldt, R3----- (Phoned, No comments)

Mike Miles, R4----- (Phoned, No comments)

Construction Engineers -- Comments requested by March 30, 2007.

Sent to Region, District Construction Engineers and Engineer for Construction on March 15, 2007 for review and comment.

**Karl Verhaeren, Engineer for Construction -----(Replied with moderate comments-
to include Non-Shrink Grout in the Precast Concrete Deck Panel, etc.)**

Dennis Simper, R1----- (Phoned, No comments)

Rob Wight, R2----- (Phoned, No comments)

Scott Andrus, R3----- (Phoned, No comments)

Bob Westover, R3----- (Phoned, No comments)

Robert Dowell, R4 Richfield----- (Phoned, No comments)

Scott Munson, R4 Cedar----- (Phoned, No comments)

Hugh Kirkham, R4 Price----- (Phoned, No comments)

Material Engineers -- Comments requested by March 30, 2007.

**Sent to Region Material Engineers and Engineer for Materials on March 15, 2007
for review and comment.**

Tim Biel, Engineer for Materials----- (Phoned, No comments)

Rodney Terry, R1----- (Phoned, No comments)

John Butterfield, R2----- (Phoned, No comments)

Jim Cox, R3 ----- (Replied, No comments)

Larry Gay, R4----- (Phoned, No comments)

Contractors (Any additional contacts beyond "C" above.)

Suppliers

Consultants (as required) (Any additional contacts beyond "C" above.)

FHWA (To be accomplished as part of the two-week process before submitting to the
Standards and Specifications Section for inclusion on the Standards Committee agenda.)
(This is in addition to the requirements of UDOT Policy 08A5-1, procedure 08A5-1.3.)
Sent to FHWA on March 15, 2007 for review and comment. -- Comments requested
by March 30, 2007.

Russ Robertson----- (Phoned, No comments)

Anthony Sarhan ----- (Replied, No comments)

Others (as appropriate)

Standards Committee

**Sent to all members of the Standards Committee on March 15, 2007 for review and
comment.** -- Comments requested by March 30, 2007.

Jim McMinimee----- (No comments)

Robert Miles ----- (Minor modifications)

Randy Park----- (No comments)

Rex Harris----- (No comments)

Karl Verhaeren -----(Moderate comments)

Richard Clarke----- (No comments)

Robert Hull----- (No comments)

Tim Biel----- (No comments)

Stan Burns----- (No comments)

Boyd Wheeler----- (few comments)

Erik Brondum----- (No comments)

Barry Axelrod----- (few comments)

Shana Lindsey----- (No comments)

Anthony Sarhan -----(No comments)

Mont Wilson----- (No comments)

Tyler Yorgason ----- (few comments)

E. Other impacted areas, systems, or personnel. (Consider all impacts and possible changes to these areas during the preparation process. Coordinate with all appropriate areas for the respective item. List all impacts and action taken.)

1. Minimum Sampling and Testing Guide (MS&T Guide)
N/A
2. Business Systems (Electronic Bid System, Project Development Business System, Electronic Program Management, Computer-Aided Drafting and Design, etc.)
N/A
3. Implementation Plan (Provide detailed instructions on how the subject item will be implemented to include notification of all interested parties and training requirements.)
N/A

F. Costs? (Estimates are acceptable.)

1. Additional costs to average bid item price.
Prefabricated bridge element structure cost is about 25~30% higher than traditional cast-in-place structure. However, on-site construction time significantly reduced and the savings from traffic control will usually offset this additional cost.
2. Operational (For example, maintenance, materials, equipment, labor, administrative, programming).
N/A
3. Life cycle cost.
Prefabrication can increase quality, and lower life cycle cost.

G. Benefits? (Provide details that can be used to complete a Cost – Benefit Analysis.)

(Estimates are acceptable.) (If no costs, what is the benefit of making this change?)
The benefits of this change include minimized traffic disruption and congestion, improved work zone safety, and minimized environmental impact. Additionally, prefabrication can improve constructability; increase quality and lower life cycle cost.

- H. Safety Impacts?
The prefabricated methods will improve safety, and reduce traffic impact to the traveling public.
- I. History? Address issues relating to the current usage of the item and past reviews, approvals, and/or disapprovals.
N/A

Priority Explanation

Enter the appropriate priority in the box on the first page of the document.

- Priority 1 Upon posting, this impacts all projects in construction and design with a Change Order, Addenda, and immediate change to projects being advertised.
- Priority 2 Upon posting, this impacts projects being advertised.
- Priority 3 Upon posting, the approved standard takes effect **four weeks** later for projects being advertised.

SECTION 02982

BRIDGE CONCRETE GRINDING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Procedure for grinding new concrete bridge decks and approach slabs for pre-cast concrete deck panel system or as shown on the Plans.

~~B. Use a polymer overlay on concrete deck after grinding.~~

1.2 RELATED SECTIONS

- A. Section 01452: Profilograph and Pavement Smoothness

~~B. Section 03371S: Polymer Overlay~~

PART 2 PRODUCTS

2.1 EQUIPMENT

- A. Provide and operate equipment utilizing diamond blades mounted on a self-propelled machine designed for grinding and texturing pavement.
- B. Do not use equipment that causes damage to the transverse or longitudinal joints.
- C. Use vacuuming equipment to remove residue and excess water.

PART 3 EXECUTION

3.1 GRINDING

- A. Grind concrete bridge deck until the surface of both sides of closure-pour and deck-panel joint are in the same plane and meet the smoothness required. Cure shear stud blockout locations for 24 hours before grinding. These locations must meet the straight-edge requirements after grinding. Maximum depth of milling is $\frac{1}{4}$ inch.

- B. Provide a uniform finished texture.
- C. Perform grinding in a longitudinal direction. Begin and end grinding at lines normal to the bridge centerline.
- D. Do not damage the deck.
- E. Create a surface in a parallel, corduroy-type texture consisting of grooves between $\frac{1}{16}$ and $\frac{1}{8}$ inches wide. The peaks of the ridges need to be approximately $\frac{1}{16}$ inch higher than the bottom of the grooves.
- F. Maintain cross slope drainage.
- G. Provide uniform transverse and longitudinal slope of the concrete deck with no depressions or misalignment of slope greater than $\frac{1}{4}$ inch in 10 ~~feet~~ft when tested with a 10-~~foot~~ft straightedge.
- H. All tailings from the grinding process become property and responsibility of the Contractor.

3.2 SMOOTHNESS TESTS

- A. Follow Section 01452.

END OF SECTION

SECTION 03339

PRECAST CONCRETE DECK PANEL

PART 1 GENERAL

1.1 SECTION INCLUDES

- ~~A.~~ A. This work consists of furnishing, erecting, and grouting all pre-cast concrete deck and approach slab panels including all necessary materials and equipment to complete the work as shown on the plans.
- B. Placing Structural Non-Shrink Grout into the girder camber strips and filling the shear stud blockouts in the bridge precast concrete deck panels. This is not for post-tensioning operation.
- C. Procedures for preparing and installing Structural Non-Shrink Grout.

1.2 RELATED SECTIONS

- A. Section 03055: Portland Cement Concrete
- ~~B.~~ Section 03056: Self-Consolidating Concrete (No reference)
- ~~BC.~~ Section 03211: Reinforcing Steel ~~a~~And Welded Wire
- ~~CDG.~~ Section 03310: Structural Concrete ~~(No reference)~~
- ~~ED.~~ Section 03601: Structural Non-Shrink Grout ~~(Reference removed in 2.1 E and 3.3 A)~~

1.3 REFERENCES

- ~~A.~~ UDOT Quality Management Plan
- A. AASHTO T 106: Compressive Strength of Hydraulic Cement Mortar
- B. AASHTO T 160: Length Change of Hardened Hydraulic Cement Mortar and Concrete
- C. UDOT Accepted Product List

D. UDOT Quality Management Plan

1.4 SUBMITTALS FOR PRECAST CONCRETE DECK PANEL

- A. Shop Drawings furnished to the Engineer:
1. ~~One set~~Five Shop drawings: 1 full-size, 24 x inch by 36 inch, and four sets4 half-size, 11½ inch by 17 inch sheets with a 1½ inch blank margin on the left-hand edge.
 2. Place the ~~State~~ project designation data in the lower right-hand corner of each sheet.
 3. Prepare shop drawings under seal of a Professional Engineer.

~~A.B.~~ Department rejects units fabricated ~~before~~prior to written approval.

~~1.51.5~~ **SUBMITTALS FOR CONSTRUCTION METHODS**

- A. ~~Provide Contractor to furnish~~ construction methods to Engineer.
- B. ~~Shop Drawings:~~ Submit five copies of shop drawings to the Engineer for approval. ~~These drawings~~ designed by a Professional Engineer will include, but are not limited to, the following ~~information:~~
- ~~1.~~ 1. Type and location of lifting inserts or devices.
 - ~~2.~~ 2. Details of vertical adjusting hardware.
- ~~B.C.~~ Do not order materials or begin work until receiving final approval of the shop detail drawings.
- ~~C.D.~~ All details are subject to modification or approval.
- ~~D.E.~~ Do not deviate from the approved shop drawings unless authorized in writing. Contractor is responsible for costs incurred due to faulty detailing or fabrication.
- ~~F.~~ Engineer reserves the right to retain shop drawings up to 14 calendar days without granting an increase in the number of working days for the project. This right applies each time the drawings are submitted.
- ~~1.~~ If the drawings are held in excess of 14 calendar days and cause a delay in the Contractor's operations, the contract time may be increased by the number of days delayed.
 - ~~2.~~ Written notification and justification must be submitted within five working days after approval if claiming an increase in contract time.

~~1.6~~ **1.6 SUBMITTALS FOR ERECTION PLAN**

~~A.A.~~ Follow the sequence ~~as~~ shown on the pPlans to remove the existing

bridge deck slab and erect the new deck composed of precast concrete deck panels.

~~B.B.~~ Submit a detailed plan to Engineer for approval 14 days before construction begins. This detailed plan will include, but not be limited to the following information:

1. Approximate location of cranes.
- ~~2.~~ ~~2.~~ Method of forming closure joints.

1.7 SUBMITTALS FOR STRUCTURAL NON-SHRINK GROUT

A. Certificate of Compliance to the Engineer

B. Proposed method, sequence, and equipment for grouting operation.

PART 2 PRODUCTS

2.12.1 MATERIALS

A. ~~Use Concrete~~ Class AA (AE) concrete for precast concrete deck panels as specified in ~~will conform to the requirements of~~ Section 03055 and as specified on the plans. Self-~~c~~Consolidating ~~c~~Concrete mix designs may be submitted to Engineer for approval as an alternate to the structural concrete for the precast deck panels.

~~B.B.~~ Use coated ~~r~~Reinforcing steel as specified in ~~conformance with~~ Section 03211.

~~C.C.~~ ~~Submit for approval types and location of~~ Lifting ~~inserts or d~~ Devices; ~~t~~ Types and location will be ~~designed by a Professional Engineer and submitted for approval.~~

~~D.CD.~~ ~~Show v~~ Vertical ~~a~~ Adjusting ~~h~~ Hardware; ~~Adjusting devices will be as shown on the plans. Alternative devices may be substituted The Contractor may substitute alternate devices with approval from the Engineer.~~

~~E.DE.~~ Use mechanical threaded couplers ~~(when specified)~~ for precast concrete deck panel reinforcing as specified; ~~Con~~ in ~~form with the~~ Section 03211.

~~F.E.~~ ~~F.~~ Use sStructural ~~n~~Non-~~s~~Shrink gGrout for girder camber strips and shear stud blockouts, as specified in; Structural Non-Shrink Grout will conform to the requirements of ~~Section 03601.~~

1. Mix structural non-shrink grout just prior to use, in accordance with the manufacturer's instructions. Use concrete gray in color and containing no calcium chloride or admixture containing calcium chloride or other ingredient in sufficient quantity to cause corrosion to steel reinforcement. Use quick-setting, rapid strength gain, non-shrink, and high-bond strength grout.
2. Warranty the in-place structural non-shrink grout performance and workmanship for two years. Repair or refund at the Department's option any bonding failures that occur during the warranty period.
3. Use structural non-shrink grout that meets a minimum compressive strength of 3,000 psi within 24 hours and 5,000 psi within seven days when tested as specified in AASHTO T 106. Meet all the requirements of AASHTO T 160 with the exception that the Contractor-supplied cube molds will remain intact with a top firmly attached throughout the curing period. Structural non-shrink grout will have no expansion after seven days and will have a one-hour compressive strength of 500 psi.
4. Select non-shrink grout from the UDOT Accepted Products List.

F. Use a G. — pPre-qualified project site precaster for fFabricator will be pre-qualified as a precast concrete rete products supplier of precast concrete products in accordance with the Department's "Quality Management Plan: Precast-Prestressed Concrete Structures."

GH. Cure all panels for a minimum of 56 days for all panels, prior to placing on superstructure.

PART 3 EXECUTION

3.13.1 FABRICATION:

A. A. Do not place concrete in the forms until the Engineer has inspected and approved the placement of all materials in the deck panels.

B. Finish the precast concrete deck panels following Section 03310.

3.2 PLACING PRECAST CONCRETE DECK PANELS

÷

- A. Place the precast concrete deck panels as shown on the pPlans.
- B. Check the grade of the deck panels a—After all deck panels in a span are placed and prior to joining, check the grade of the deck panels and adjust to provide the elevations shown on the pPlans.
- ~~C.C.~~ After the proper grade is achieved, prevent shifting of the pre-cast concrete deck panels during the joining of all the deck panels.

3.3 PREPARATION AND PLACINSTALLATIONNG OF STRUCTURAL NON-SHRINK GROUT

÷

- ~~A.~~ Form the girder camber strips after shear studs are installed at the locations shown on the plans. Grout the shear stud blockouts and girder camber strips using sStructural nNon-sShrink gGrout as specified in. Structural Non-Shrink Grout will conform to the requirements of Section 03601.
- A. Clean the girder camber strips and shear stud blockouts prior to placement of the grout.
 - 1. Use a high-pressure water hose and hydro-blast with a 30,000 psi minimum pressure.
 - 2. Contain or collect the wash water as required by the Department.
 - 3. Remove the excess water by blowing the area with compressed air or with a vacuum hose.
- B. Keep bonding surfaces free from laitence, dirt, dust, paint, grease, oil, rust, or any contaminant other than water.
- C. Pre-test the materials under field conditions at the grout pocket and camber strip anticipated to determine whether subsequent cracking will occur. The corrective action will be at the discretion of the Engineer. Proceed with grouting process at the direction of the Engineer.
- D. Saturate surface dry (SSD) all surfaces receiving structural non-shrink grout.
- E. Apply product following manufacturer's recommendations preparation and installation.
- F. Cure structural non-shrink grout per manufacturer's recommendation. Contact the manufacturer's representative for advice on how to reduce heat such as wet curing or adding retarding admixture if the heat of hydration is excessive.

- G. Use a mix design in accordance with the requirements of Section 03055 if adding more than 15 pounds of coarse aggregate (size No. 8) or larger per 50 pound bag of structural non-shrink grout.
- H. Place grout in the girder camber strips and shear stud blockouts in a continuous operation within a panel after all panels and shear studs are fully installed.
- I. Form the girder camber strips as shown on the plans after shear studs are installed at the locations shown on the plans. Grout the shear stud blockouts and girder camber strips using structural non-shrink grout.
- J. Submit the methods for forming the girder camber strips and installing the grout to the Engineer for approval.
- K. Do not allow voids in the grout for the girder camber strips and shear stud blockouts.
- L. Do not apply superimposed dead loads or live loads to the precast concrete deck panels until the structural non-shrink grout in the shear stud blockouts and the girder camber strips have been in place for two hours.

END OF SECTION

Standards Committee Submittal Sheet

Name of preparer: Paul West

Title/Position of preparer: Wildlife Biologist

Specification/Drawing/Item Title: Type G, Right of Way Fence (Deer Barrier)

Specification/Drawing Number: Drawings FG 1A, 1B, 2A, and 2B

Specification Sheet – Section 02822, Right-of-Way Fence and Gate

Enter appropriate priority level:

(See last page for explanation)

3

Sheet not required on editorial or minor changes to standards. Check with Standards Section.

NOTES:

1. All Submittal Sheets must be completed and sent to the Standards and Specifications Section by the Standards Committee suspense date as shown on the Web.
(<http://www.udot.utah.gov/index.php/m=c/tid=303>)
2. The Preparer of the Submittal Sheet or the Standards Committee member (or authorized substitute) responsible for the submittal must be present at the Standards Committee meeting and capable of discussing and answering all questions related to the submittal. The item will be postponed to a later meeting if one of these people is not present.
3. Notify the Standards and Specifications Section immediately of any changes that impact the presentation to include absence of sponsor or delay in presentation.

Complete the following: (Use additional pages as needed.)

- A. Why? Detail the reason for changing the Standard (Specification or Drawing), what has initiated a new Standard, or what has caused a new or changed item of interest.

Increasingly, the Utah Division of Wildlife Resources (UDWR) is finding wild animals entangled in our 6-foot, Type-G wildlife fences with 6' x 6' wire mesh, or impaled on fence posts.

In addition, it has been demonstrated that deer can work the openings in the current 6"x6" mesh with their snouts and hooves, making the openings wider until they are able to crawl through (Bissonette and Cramer, Utah State University, personal communication).

Based on recommendations from the UDWR, it is proposed we use an 8-foot high fence, rather than the 6-foot fence we are currently using. This new standard would also require the use of V-mesh fencing material. This type of wire mesh prevents deer from working the openings in the mesh, saving maintenance time and costs, and helping to prevent wildlife from getting on the right-of-way.

This new standard would only be required where the UDOT wildlife biologist, or wildlife biologists from the Utah State Division of Wildlife Resources have determined that wild animals, primarily deer, elk, and moose, are constituting a hazard to motorists and/or are being killed in great numbers on our state's highways and freeways, and thus need to be prevented from getting onto the right-of-way. This 8-foot, V-mesh fencing should only be used with wildlife escape ramps and crossing facilities that would allow for animals to cross the highways and freeways safely.

- B. How is Measurement and Payment handled? Existing (from the measurement and payment document), modified, or new measurement and payment to be included with all Standard Specifications or Supplemental Specifications.

Existing (by feet)

- C. Stakeholder Notification for AGC and ACEC:

By email provide the AGC and ACEC Standards Committee member a copy of all pertinent information relating to the specification or drawing. Detail all responses below. Indicate if no comments were received.

Note: There is a two-week response time set for this item.

AGC Comments: (Use as much space as necessary.)

ACEC Comments: (Use as much space as necessary.)

Tylor Yorgason – P.E., Civil Science

I received no comments from ACEC regarding the updated Specifications for Right-Of-Way Fence and Gate, and 4 updated FG series drawings. Thanks for the chance for ACEC to comment on the changes.

- D. Stakeholders? From the list provided, document the stakeholders contacted, detailing: the company, name of contact, how contacted (by phone, email, hard copy, or in person), concerns, and comments of the change. Stakeholders:

Note: There is a two-week response time set for this item. Allow Stakeholders two weeks to process and respond to coordination requests. All areas should try to complete review and comment as soon as possible but within two weeks.

In-house (for example, preconstruction, materials, construction, safety, design, maintenance) (Include all applicable in-house areas even if not listed above.)

Rex Harris – Pre-Construction Engineer, Region 1

I have no negative comments to make about the standard drawing as proposed.

Brent DeYoung – Sr. Project Manager, Region 1

I reviewed the information and the comments the others made covered my issues as well.

Randy Jefferies – Engineering Manager, Region 1

FG 1A and FG 2A:

1. Remove the note under Type F fence "To be installed in deer country."

Type F fence eliminated.

2. Revise "NOTE" to "NOTES ON TYPE G FENCE"

Done

3. Combine the first 3 sentences of Note 1 to "LAP THE 50-inch TALL MESH WIRE 4 inches AND TIE OR CLAMP TOGETHER AT NO GREATER THAN 2 foot SPACING."

Done

4. Revise "THEN" to "THAN" in Note 3.

Done

Scott Nussbaum – Engineering Manager, Region 1 Maintenance

I'm not opposed to the change, but here are just a few notes:

I think that most of our maintenance on fence is due to snow pressure and vandalism. I suspect an eight-foot fence will be MORE difficult to maintain, requiring ladders, etc. for regular work.

If properly constructed, snow pressure should not be a consideration. In speaking with a representative from Steve Regan Company, he said V-mesh fences are secure in any kind of weather, and are difficult for animals, elk and moose included, to knock over. The 10-foot steel T-posts, if properly buried to 20" depth, are secure enough to withstand almost any kind of pressures. Therefore, maintenance due to wildlife damage should be almost nil. As for vandalism, that can't be predicted or prevented with any kind of fence. However, the V-mesh is much more difficult to cut through which should discourage many vandals.

The increased cost does not include additional post cost, foundation digging, or the increased labor associated with a taller fence.

I have revised the cost estimate to reflect a more realistic cost.

With the additional height and the tighter mesh, does the design compensate for the wind/snow pressure, or does the post spacing also need to be modified? (I'm concerned about the T-posts especially).

In speaking with the sales representative from Steve Regan Company, he assures me that if the 10-foot T-posts are properly buried, the fence should stand up under any kind of pressure.

The drawings do not show the V-Net pattern.

Fixed

Chris Lizotte – Environmental Manager, Region 1

Comment: No changes, except to say that it looks a little low to be a deer barrier...??

A. *8 feet is low? It's got to be better than the 6-foot fence we are using now.*

Comment: Deer normally will not jump a 6-foot fence, but if chased or threatened, they can clear an 8-foot fence on level ground.

A. *Perhaps. But it will block them better than the 6 foot fence. That's the council I've been given from John Bissonette and the UDWR biologists. With the V-mesh they can't tear it down, or poke holes in it as well either. That's the reason for all this change of specs.*

Comment: I agree this is a good change.

Bill Lawrence – Pre-Construction Engineer, Region 2

Q. I've tried search on the web for the V-net, or V-web mesh fencing your calling out and can't find it. Where is it to be obtained?

A. *I think the preferred name for this kind of fence material is V-mesh. There are two places. Steve Regan in Salt Lake and Davis Wire in Pueblo, Colorado. Actually, Regan gets their V-Mesh from Davis Wire who is the manufacturer.*

Q. One more question, the drawings show square openings. Does the V-net, or V-web mesh, still have square openings? Based on the name I pictured a different style. If its still as on the drawing, I'm ok with it. If it doesn't match what is on the drawing, it should be fixed.

- A. *You're right, it needs to be fixed. I just didn't have a good drawing of the V-Mesh before this went out. It will be shown on the final drawings.*

Joe Kammerer – Sr. Project Manager, Region 2

I have no comments

Kevin Kilpatrick – Environmental Manager, Region 2

I don't have any comments or suggestions for the deer fence. The only question I have is whether the increased cost would make them less likely to get installed in certain areas (probably more a question for the PMs). I don't doubt the increased effectiveness of the higher fence.

Project managers and designers need to specify this type of fencing after consultation with and recommendations from the UDOT wildlife biologist, or biologists from the Utah Division of Wildlife Resources.

Brent Schvaneveldt – Pre-Construction Engineer, Region 3

No comment

Merrell Jolley – Sr. Project Manager, Region 3

No comments.

Rich Crosland – Environmental Manager, Region 3

- Q. Shouldn't there be some distance specified between the barbed wire?

A. *No barbed wire.*

- Q. well whatever kind of wire is on the typical.

A. *The only wire we're suggesting is the V-mesh. No single wires on the Type-G deer barrier fence.*

Bret Sorenson – Pre-Construction Engineer, Region 4

I haven't had a chance to take a real close look, but it makes sense if the 6' isn't working. I would ask if 7' works. Also, it doesn't appear that any of our construction personnel or contractors have been included in this review. I think they're the most important group to ask.

A 7-foot fence would work a little better than 6-foot fences, but an 8-foot fence is what wildlife biologists across the nation, as well as internationally, recommend, and it works even better than a 7-foot fence. It should not cost much more than the 7 footer, if any more.

As for whom I have contacted, I have contacted everyone who was recommended to me.

Mike Miles – Sr. Project Manager, Region 4

On Fig 1A for the typical for the type G deer barrier, notes 1 and 2 say "lap the 50 inches by 4 inches." It sounds awkward to me. It might sound better to say "lap the 50 inch mesh by 4 inches." This isn't critical but may clarify things some.

Done

Fred Jenkins – Engineering Manager, Region 4

Sum of individual dimensions exceeds 12 ft post height by 2 inches on FG1A. Also, the stay appears to be 50 inches long on the drawing, not 54 inches.

I think the dimension is right (the 12-foot T-posts have been replaced with 10-foot T-posts). The stays have been eliminated.

Q. Your 1 inch Maximum Allowable Gap will result in the burying the bottom wire - is this what you want?

A. Yes. The notes on the drawing have been updated to reflect this.

Steve Ogden, Engineering Manager, Region 4

I have made a few comments on FG 1A and FG 2A. I sent these drawings to Dave Babcock, who may have additional comments. (Drawings are included at the end of this document)

Comments on Figure FG 01A:

Referring to the drawing labeled "Typical". Is this value 4" or 5" for Type G?

This question refers to the top 4" (not 5") of the wood post on the drawing labeled "Typical". The figure clearly reads 4". Nothing was changed on this drawing. However, the height of the wood post, or the T-post, above the V-mesh is not important.

Referring to the drawing labeled "Typical". Should this number be 8'-4" for the new Type G?

This question refers to the height of the post shown on the "Typical" drawing that currently indicates for Type G fences that the height should be 7 feet. This has been changed to 8' 4".

Referring to the drawing labeled "Type G". The way I read this, there is 102" above ground and 44" below ground making a total of 146". Should the above ground dimensions equal 100"?

I think it does add up to 100" (50" mesh + 50" mesh - 4" overlap + 4" top of post = 100")

Comments on Figure FG 2A:
Same comments as FG 1A

Clark Mackay – Engineering Manager, Region 4

Here are my comments relating to the recommended changes in deer fence.

Sheet FG 1A Typical detail above Type G fence detail.

Move arrow for top wire so that it points to the dimensional line for 4".

Done

Under type G change 7'-0 to 8'-4.

Done

Type G detail change 4" overlap to 6".

No. 4" over lap is needed to achieve 96" height.

If you really want 4" then you will need 12'-2 posts.

*Changed to 10-foot T-posts and keeping with 12-foot, 4-inch, or 5-inch wooden posts.
The height should still work.*

Note 1 change 4" to 6".

No. 4" over lap is needed to achieve 96" height.

Note 2 conflicts with standard specification 2822. If you want to change the type of wire then you will need to change the standard specification.

Done

"Gage" is spelled 'Gauge'. Note 3 change 'then' to 'than'.

Done

Sheet FG 1B

Detail line brace for type G fence change 'interwals' to 'intervals'.

Done

Bottom right corner move heading 'Post and wire location' so as to be centered under the detail rather than along side it.

Not part of this exercise, but done anyway.

Add 'For limited access and no access highway R/W lines'.

Not sure what he's talking about, but I think it's outside the scope of this exercise.

Sheet FG 2A

In the detail in the upper part of the sheet near the center of the detail is a dimensional line and arrow that points to nothing. Please remove this.

Not part of this exercise, but noted anyway.

General notes on Sheet FG 2A:

Note 1. Change 'Class B' to 'Class B(AE)' to match standard specification.

Not part of this exercise.

Note 2 remove second comma between D & E.

Not part of this exercise, but done anyway.

Note 3 change 'psts' to 'posts'.

Not part of this exercise, but done anyway.

Note 5 change 'barber' to 'barbed'.

Not part of this exercise, but done anyway.

On deer fence detail and in note 1 change overlap to 6".

No. 4" overlap is needed to achieve 96" height.

Again note 2 does not match standard specification and has spelling error.

It matches the standard specifications proposed to go with these changes. Spelling error changed.

Note 3 change 'then' to 'than'.

Done

General discussion:

You show additional horizontal wires attached to mesh at bottom. Is there a purpose for these additional wires? I recommend that you use straight 6" spacing on horizontal wires. This would allow the contractor to use the same mesh for both top and bottom.

There are NO horizontal wires. Perhaps what Clark is seeing is the exaggerated lines where the 4" overlap occurs.

Have you checked to see if the 50" mesh is available. You need to make sure that this is common size and available and does not require a special order to get this size. The same applies to the additional horizontal wires at the bottom if you feel they are necessary.

V-mesh is available in 50" rolls. As for horizontal wires at the bottom, there are none.

I do not feel the 1" gap at the bottom of the fence is realistic. Deer fence does not usually go on easy or smooth terrain. Are you planning on having the contractor grade between line posts to achieve this? This will increase the environmental impacts. If not then the contractor will have to place many tie down rocks as shown on sheet FG 1B Typical sag detail. This is going to substantially increase the cost of installing deer fence. The contractor will still need to do some grading to achieve the 1" limitation.

Contractor should be required to bury the wire if needed. No grading, other than ditching, should be necessary.

Dave Babcock – Roadway Operations Safety Manager, Region 4

I'm glad to see we have changed to two pieces of 50" net fence and no barb, which will make for an 8 foot fence, but I am concerned about the 12 foot posts. I realize we need that size of post to hold the weight, but it is almost impossible to pound a 12 foot post. The 10 footers have been a trick, we put a guy up in the bed of a 1 ton and use the post pounder crane to lift the weight of the pounder. I'm not sure we can reach to 12 feet high??? Do we really need 12 footers? We also don't need any post height over the top of the fencing.

12' T-post have been replaced with 10' T-posts. As for post height over the top of the fencing, I agree. We don't need that if it's not possible to achieve.

Mike Seng, Engineering Manager, Region 4

No comments

Randall Taylor – Environmental Manager, Region 4

Initial questions: When I called Steve Regan they said the longest available metal post is 10-ft. Do you know if 12-ft metal posts will be available?

12' T-post have been replaced with 10' T-posts.

Looking at the dimensions shown on FG 2A for Type G (middle left detail), do you read this as 44" below ground, then 1" to bottom of net wire, then 101" from bottom of wire to top of post? This would be a total of 146" for posts that are 144" in length. Maybe I'm reading it wrong. The 44" below ground seems like a tremendous depth that would be difficult to achieve in rocky conditions. Is this being used elsewhere?

The details have been changed. For T-posts, 20" below the ground is all we need. Then, two 50" rolls of V-mesh, overlapped by 4". A 1" gap at the bottom is allowable where necessary. The length of the post above the mesh is not important.

Thanks for your work on this much needed subject.

Additional Comments:

- 1) Are 12-ft "T", metal posts, available? When I called Steve Reagan Co. they said the longest available metal post is 10-ft. I think it is possible to get more fence height out of the 10-ft posts by decreasing the depth placed in the ground and by decreasing the height of the posts above the top of the fence wire.

No, the tallest T-posts are 10'. I've changed the drawings to reflect this.

- 2) I didn't know there was much if any problem with the 6" X 6" net. I think this should be reviewed with Bruce Bonebrake and others, such as UDOT Maintenance people. I'm not sure the extra cost is warranted. Should other alternatives be considered, such as a 4"X4" net?

According to Doctors John Bissonette and Patricia Cramer, Professors of Wildlife Biology with Utah State University, deer often work the 6" x 6" mesh openings with their noses and hooves until they can crawl through. This adds to maintenance costs, but more importantly to wildlife mortality and vehicle safety issues.

- 3) Note #2 on Drwg FG 2A provides that Type A,B, D, E, and F line posts shall be made of Tee channel with a minimum weight of 1.33 lb/ft. The minimum weight is not defined for Type G line posts. This particularly needs to be addressed if posts longer than 10-ft are specified. I think that 10-ft posts have been the 1.33 lb/ft – at least they

visually appear to be the same weight as the shorter posts. I'm thinking this weight is determined by the manufacturer and the contractors order 10-ft Tee posts.

We're using 10' T-posts. Note changed to reflect T-posts for Type G fence fits this spec. A representative from Steve Regan Company assured me that the strength of the 10' T-posts is sufficient to hold back most pressures, including a charging elk or moose.

- 4) On FG 2A the middle left detail for "Right of Way Fence Type G" fence has dimensioning that is difficult to decipher. It looks like 44" of post below ground, then 1" to bottom of net wire, then 101" from bottom of net wire to top of post. This makes a total of 146" for posts that are 144" in length.

Below ground has been changed to 20" with 10' T-posts. Bottom wire to maximum of 1" Top of post to be "not more than 4" above the V-mesh.

I wonder about the 44" of post below ground. This seems like a tremendous depth in almost any ground, and one that is not likely to be achieved in ground with many rocks. Is this depth of burial needed? It will certainly add to the installation time and effort, which means costs.

Changed to 20" for T-posts.

- 5) Two stays are shown in between line posts on FG-2A, left middle detail for "Right of Way Fence Type G". They look like the length should be 50". Is this correct and is this length available?

Stays are not needed. Drawing changed to reflect this.

- 6) If the change is made to 12-ft line posts, then the brace posts may need to be reviewed. These are called out in Note 3 on Drwg. FG 2A.

Lines posts changed back to 10'

- 7) For Note 6, on Std Drwg FG 2A, Corner post braces for Type G fence are required for line posts deviations greater than 15 degrees. I think compliance would be better if we said use brace posts for line post deviations greater than 3-ft in 10-ft, since this is easier for fencing crews to follow. They don't typically have a means of measuring angles.

Changed

If this change is made the 30 degree threshold for line posts deviations in other types of fences should also be change to 5.8-ft in 10-ft, although this seems high. Maybe it should be for deviations greater than 5-ft in 10-ft.

Changed

Boyd Wheeler – Engineering Manager, Structures

Paul, please consider changing the note under the type F fence to clarify when this fence should be used. i.e. used in deer areas unless specifically directed otherwise.

Type F fence eliminated.

Q. With the new height of type G barrier fence will our deer escape ramp standard need to be modified?

A. *I don't think they'll need to change. Do you see a reason for changing them?*

No, I think the type G will tie into them alright on second look.

Lynn Bernhard – Engineering Manager, Maintenance Planning Division

I have a few comments

Dwg FG 1A Type G fence note 1 - specify the spacing of mesh ties or clamps. If we say not more than 24" we will get 24" every time. I think the fabric should be connected 12 inches on center with metal ties or clamps.

Note changed to specify 12" spacing of clamps, using hog rings, or other types of ties or clamps.

Specify distance that wire stays extend into lower course of fabric. I recommend 6 inches.

Stays not needed with V-mesh. Drawing changed to reflect this.

Dwg FG 1A Type G fence note 2 - specify doubled and twisted 12½ gauge line wires with 14 gauge V-wires

Done on Spec sheet and both drawings.

Dwg FG 1A Type G fence note 3 - replace "THEN" with "THAN"

Done

Dwg FG 1A Type F fence - replace the barbed wire symbol for the top wire with plain wire. Change wire to ground distance to 1" to match rationale for bottom of fabric on type G fence

Type F fence eliminated.

Dwg FG 2A - note 2 - add note for Line posts - Type G Fence.

Done

Copy text from note 2.2 and 2.3

If these notes are part of the Standard Specification, do they need to be on the Standard Drawing too?

Specification:

02822 1.3 Add citation for ASTM A 116 Standard Specification for Metallic-Coated, Steel Woven Wire Fence Fabric

Done.

02822 1.3 Add Specification for Zinc Coated Chain-Link Fence Fabric ASTM A 392

Done

02822 2.2.A - specify doubled and twisted 12 ½ gauge line wires with 14 gauge V-wires. On chain link fencing - specify wire gage - I recommend galvanized 9 gage 2-3/8" mesh.

Done

Shane Marshall – Director, Environmental Services

Looks fine

Rebecka Stromness – Environmental Program Manager

No Comment

Robert Miles – Preconstruction Engineer, Project Development, Standards

FG 1A: Call out required spacing for staples?

Note changed to specify 12" spacing of clamps, using hog rings, or other types of ties or clamps.

On Typical Type G post shows 7' not 8'4"

Done

FG 2A

Call out method and spacing of attaching fencing to posts

Note changed to specify 12" spacing of clamps, using hog rings, or other types of ties or clamps.

FG 2B

Update Typical sag section to metal posts

Done.

Section 02822

I don't believe highlighted line of text is necessary. Combine with 3.2 M

Done.

Rukhsana Lindsey – Director of Research

Looks good

Contractors (Any additional contacts beyond "C" above.)

None

Suppliers Contacted:

Steve Regan Co.

Davis Wire, Pueblo Colorado (manufacturer)

Consultants (as required) (Any additional contacts beyond "C" above.)

None

FHWA (To be accomplished as part of the two-week process before submitting to the Standards and Specifications Section for inclusion on the Standards Committee agenda.) (This is in addition to the requirements of UDOT Policy 08A5-1, procedure 08A5-1.3.)

Anthony Sarhan - FHWA

We have reviewed the submittal and offer a comment and a question.

First, no barbed wire is recommended or even suggested for the new Type G Deer Barrier fence. Barbed wire is mentioned in the update to section 02822 ROW Fence-Gate (section 2.3) which was included in your e-mail.

Comment: please limit use of barbed wire to rural areas. Barbed wire should not be used in urban areas.

No barbed wire is suggested for the Type-G fence. Any other recommendations are beyond the scope of this exercise.

Second, wood posts would be used wherever they are being used currently. I'm not the one who would make that decision. It would be made by whomever is building the fence, or the project manager.

Question: Can you please explain where wood posts are expected to be used throughout Utah?

Steve Regan Company recommends wood posts every 165 feet where rolls end, or at corners. At most, every 100 feet. The V-mesh fencing material does not require more than that.

Others (as appropriate)

None

- E. Other impacted areas, systems, or personnel. (Consider all impacts and possible changes to these areas during the preparation process. Coordinate with all appropriate areas for the respective item. List all impacts and action taken.)

1. Minimum Sampling and Testing Guide (MS&T Guide)

N/A

2. Business Systems (Electronic Bid System, Project Development Business System, Electronic Program Management, Computer-Aided Drafting and Design, etc.)

N/A

3. Implementation Plan (Provide detailed instructions on how the subject item will be implemented to include notification of all interested parties and training requirements.)

Preconstruction, design, construction, maintenance, and fencing contractors will begin using the revised Type G, Deer Barrier, Right-of-way Fence – Standard Drawings (FG series).

F. Costs? (Estimates are acceptable.)

1. Additional costs to average bid item price.

V-mesh

Rolls come in 50" x 165' size. Cost of 50" rolls is about \$1.50 per foot (cost estimate by Steve Regan Co.). Two rolls overlapped by 4 inches, as would be required to make an 8' fence, would cost \$3.00 per foot.

Current price for 6" x 6" mesh wire fence (two 47" rolls overlapped by 2 inches) is \$1.50 per foot (cost estimate by Steve Regan Co.).

V-Mesh will constitute an increase of approximately \$1.50 per foot. However, this cost will be offset by greatly lowered maintenance costs. Almost no maintenance is required if properly installed.

As an alternative, 8-foot chain-link fencing may be substituted. However, the cost of chain-link is approximately \$7.06 per foot (cost estimate by United Fence Co.).

T-posts every 10-feet (no increase in spacing required)

Cost of 8-foot t-posts (current standard)	\$4.70 each
Cost of 10-foot t-posts	\$10.70 each

4"-5" Treated Wood Posts (suggested 1 post at most every 100 feet, or at minimum every 165 feet, or at the end of the V-mesh roll or at corners)

Cost of 10-foot wood posts (current standard)	\$9.92 each
Cost of 12-foot wood posts	\$12.00 each

(Note: Stretch panels or line braces using wood posts are not necessary with V-mesh, as V-mesh does not stretch.)

Labor

Labor cost of installation will probably increase 10 to 15 percent.

2. Operational (For example, maintenance, materials, equipment, labor, administrative, programming).

V-Mesh, or V-Net, or V-web fencing would require significantly less maintenance than the current 6"x6" mesh currently in use.

3. Life cycle cost.

Almost none. According to a representative from Steve Regan Co., a V-mesh fence constructed ten years ago still looks strong.

G. Benefits? (Provide details that can be used to complete a Cost – Benefit Analysis.) (Estimates are acceptable.) (If no costs, what is the benefit of making this change?)

Benefit will be a reduction in numbers of wildlife accidents on Utah's highways, and a subsequent reduction in vehicle accidents and wildlife mortality. Also, maintenance cost would be reduced to near nothing. V-mesh fencing material prevents deer from working the openings in the mesh, saving maintenance time and costs, and helping to prevent wildlife from getting on the right-of-way.

H. Safety Impacts?

This 8 foot, V-mesh fence would prevent most wildlife from getting on Utah's highways, thus reducing the danger to motorists and wildlife alike.

I. History? Address issues relating to the current usage of the item and past reviews, approvals, and/or disapprovals.

Currently, wild animals trying to cross Utah's highways, are attempting to jump over our 6-foot, Type G wildlife fences and die after become impaled or caught up in the wires and 6" x 6" wire mesh. Many other animals are able to jump the current 6-foot fences, becoming a hazard to motorists. An 8-foot fence would prevent most of these problems, and the V-mesh material would prevent animals from tearing holes in the fence.

A representative from Steve Regan Co., said that fences built of this V-mesh material are still strong after over 10 years of use. Horses and cattle have not been able to knock it over or tear holes in it. Deer, elk, or moose are equally unlikely to knock it over or tear holes in it. The V-mesh material does not stretch which lends strength to pressures from wildlife. Additionally, with 10' T-posts, buried 20 inches, it should be strong enough to prevent damage from snowdrifts as well.

Priority Explanation

Enter the appropriate priority in the box on the first page of the document.

- | | |
|------------|---|
| Priority 1 | Upon posting, this impacts all projects in construction and design with a Change Order, Addenda, and immediate change to projects being advertised. |
| Priority 2 | Upon posting, this impacts projects being advertised. |
| Priority 3 | Upon posting, the approved standard takes effect four weeks later for projects being advertised. |

**Supplemental Specification
2005 Standard Specification Book**

SECTION 02822M

RIGHT-OF-WAY FENCE AND GATE

Delete Article 1.3 replace with the following:

1.3 REFERENCES

- A. AASHTO M 111: Zinc (Hot Dip Galvanized) Coatings on Iron and Steel Products
- B. AASHTO M 232: Zinc Coating (Hot-Dip) on Iron and Steel Hardware
- C. AASHTO M 279: Zinc Coated (Galvanized) Steel Woven Wire Fence Fabric
- D. AASHTO M 280: Zinc-Coated (Galvanized) Steel Barbed Wire
- E. ASTM A 39: Zinc Coated Chain-Link Fence Fabric 2
- F. ASTM A 116: Metallic-Coated, Steel Woven Wire Fence Fabric
- GE. ASTM A 641: Zinc-Coated (Galvanized) Carbon Steel Wire
- HF. ASTM A 702: Steel Fence Posts and Assemblies, Hot Wrought
- G. I. ~~G.~~ National Electrical al Code (NEC)

Delete Part 2 and replace with the following:

PART 2 PRODUCTS

2.1 WIRE MESH FENCING

- A. As specified in AASHTO M 279.
- B. Grade 60, nominal 0.099 inch farm grade wire mesh fencing with a 6 inch vertical wire spacing.
- C. Class I zinc coating.

2.2 V-MESH FENCING

- A. Two 50-inch sections of V-mesh fencing material with doubled and twisted 12½ gauge line wires with 14 gauge V-wires. ASTM A 116.
- B. Heavy gauge chain-link, galvanized 9-gauge 2 3/8 inch mesh as an alternative. ASTM A 39.

2.3 BARBED WIRE

- A. Galvanized barbed wire as specified. AASHTO M 280.
- B. Two strands of nominal 0.099 inch diameter wire twisted with a four-point nominal 0.080 inch barbs no more than 5 inches on center.

2.3.4 UNTREATED WOOD POSTS FOR LINES, GATES, ENDS AND CORNERS

- A. Native juniper or approved equal.
- B. Line posts must have a minimum circumference of 10 inches.
- C. Gate, brace, and corner posts must have a minimum circumference of 12 inches.
- D. All posts must be sound, free of decay or defects, and structurally suitable.

2.4.5 TREATED WOOD POSTS AND WOOD BRACE RAILS

- A. Sound Douglas fir, hemlock, or pine that is free from decay, splits, multiple cracks or any other defect, and structurally suitable.
- B. Round or sawed rectangular post and braces.
 - 1. Round posts must have a minimum diameter of 5 inches.
 - 2. Gate brace and corner posts must have a minimum diameter of 5 inches.
 - 3. Rectangular posts must have a minimum dimension of 4 inches x 6 inches.
 - 4. Square members, a minimum of 4 inches x 4 inches may be rough sawn or S4S.
 - 5. A line drawn between the centers of the butt and tip of each post and brace rail must be inside of the actual longitudinal centerline of the post or rail within 1.67 percent of its length.
 - 6. Taper (diameter differential) in round members must not exceed 2 inches in 10 ft.
 - 7. Fabricate posts and brace rails before pressure treatment of the wood members.
 - 8. Field drill only after all exposed untreated surfaces of members are field treated with two coats of the same material as they were originally treated.

9. Treat post and brace rail following Section 06055.
10. Keep round posts free of bark, protruding knots, or other irregularities.

2.56 METAL POSTS AND BRACES (BRACE POSTS)

- A. As Specified. ASTM A 702.
- B. Coat fasteners as specified for Class 1 Coating. ASTM A 641.
 1. Omit anchor plate only if the post is set in a concrete footing with a minimum cross sectional dimension of 4 inches and a depth equal to full penetration of the post.
 2. Galvanized posts may be used in the place of painted posts if the galvanizing is a hot-dipped process that meets requirements as stated in AASHTO M 111.

2.67 TUBULAR-STEEL FRAME GATE WITH WIRE FABRIC

- A. 1 inch diameter pipe gate frames as specified.
- B. Place pipe braces vertically in each drive gate to provide uniform size panels.
 1. 10 ft and 12 ft gates must have 1 vertical support.
 2. 14 ft and 16 ft gates must have 2 vertical supports.
- C. Dimension shown on the plans and in the specifications are the minimum clear openings between gate posts. The supplier must provide a gate with fittings to fill the opening.
- D. Use galvanized woven fabric on the mesh wire fences of the same type and quality as specified for the fence and gates.
 1. Space horizontal wires corresponding to that of the fence.
 2. Provide an adjustable truss rod of 3/8 inch minimum diameter to prevent sagging on gates 10 ft or more in length.
- E. Supply hot-dipped galvanized steel fittings as specified. AASHTO M 232.
- F. Pintles for 10 ft and wider gates must be 5/8 inches in diameter or larger.
- G. Frame and walk gates must be made of 1 inch galvanized steel tubing.
- H. Fastener and single gates must be a 18 inch length of galvanized chain secured to the gate at one end and fitted with a snap fastener on the loose end.
- I. All double drive gates must have a center latch in place of a chain fastener. A pin from the latch must fit in a socket embedded in concrete.

| **2.78 STAPLES**

- A. Galvanized No. 9 wire staples at least 1-1/2 inches in length.

| **2.89 ORNAMENTAL FENCE**

- A. Galvanized fabric for a Class 1 Coating as specified in AASHTO M 279.
- B. Galvanized posts, frames and fittings as specified in AASHTO M 232.
- C. Fabricate following FG series Standard Drawings.

| **2.910 CONCRETE**

- A. Class B(AE) concrete. Refer to Section 03055.
- B. Contractor may substitute higher class of concrete.

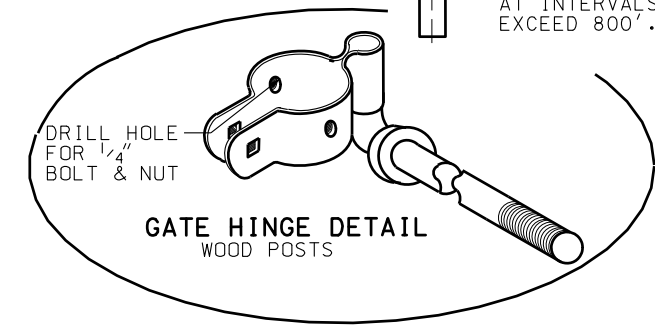
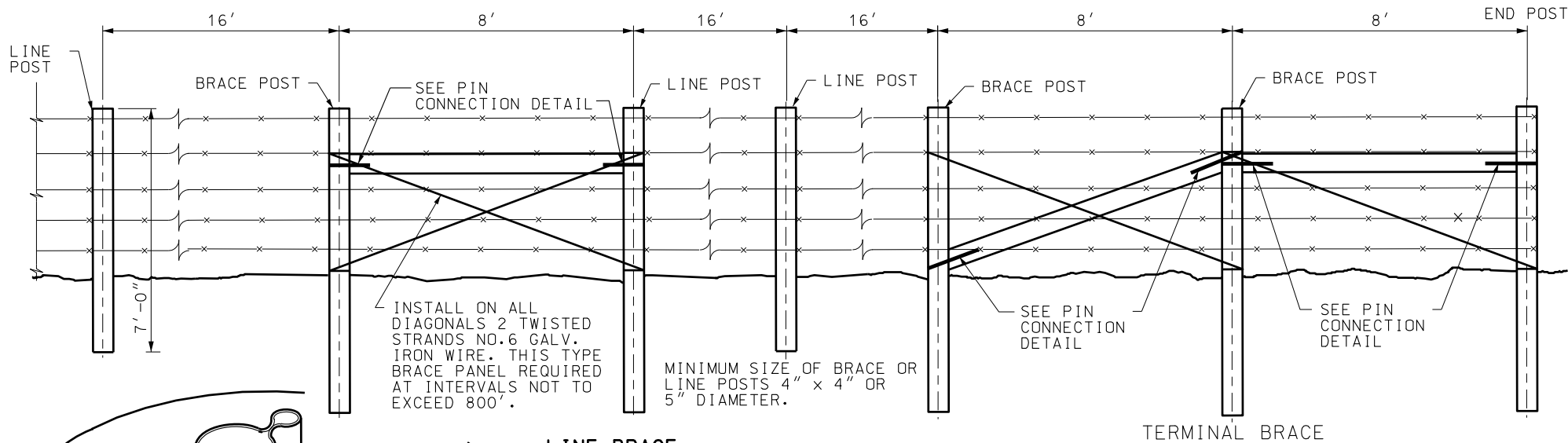
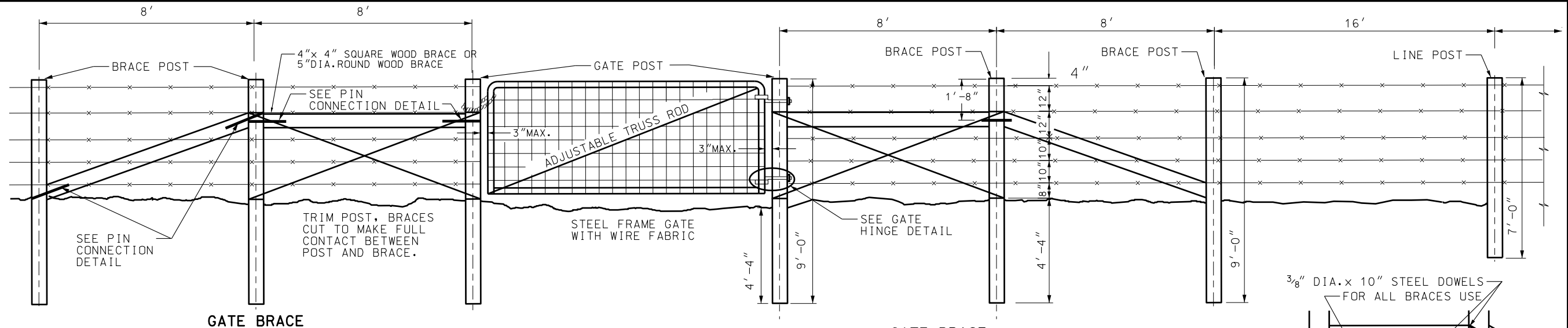
Delete Article 3.2, paragraph K and replace with the following:

- | K. Install grounds anywhere electric transmission, distribution, or secondary lines cross a wood post fence, conforming to industry standard. (National Electrical al Safety Code, Section 9).

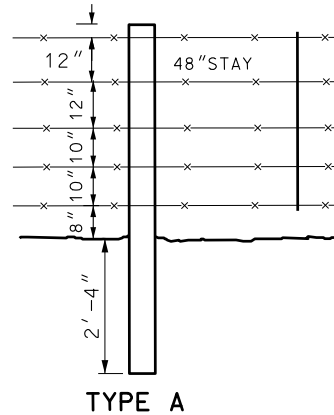
Delete Article 3.2, paragraph M and replace with the following:

- | M. Install ~~ornamental fence~~ all fences following FG series Standard Drawings.

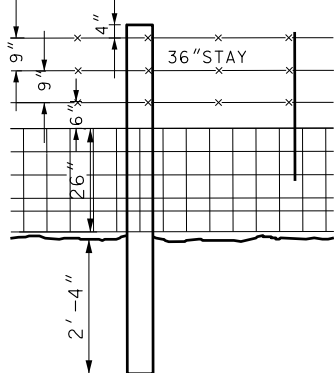
DGN File: D:\Standards\SpecSection\Standards Committee\Meeting\126_07Mtg Drawings\Fg1a.dgn 10-APR-2007



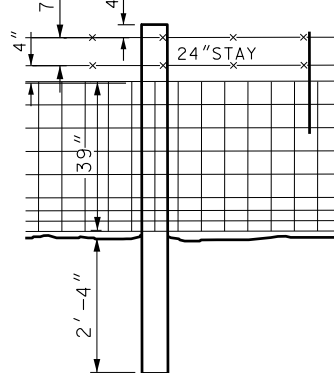
POST SIZE, SPACING AND BRACING FOR TYPES A,B,D,E AND F FENCE THE SAME AS SHOWN IN TYPICAL INSTALLATION ABOVE. USE TWO STAYS EVENLY SPACED BETWEEN EACH SET OF POSTS.



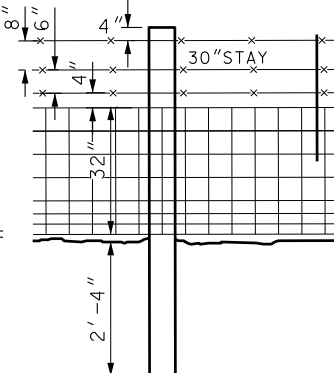
TYPE A



TYPE B

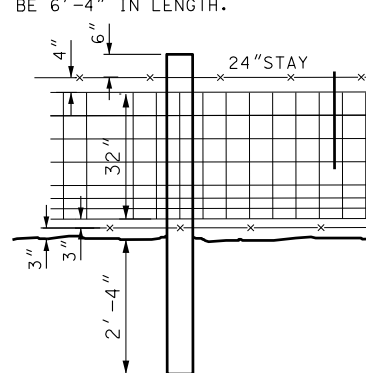


TYPE D

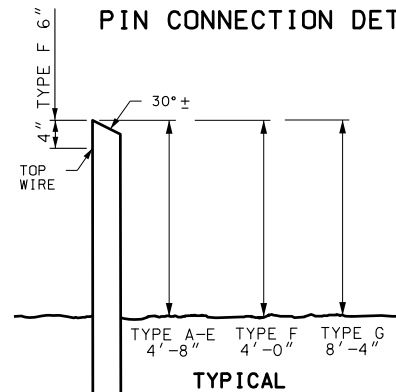
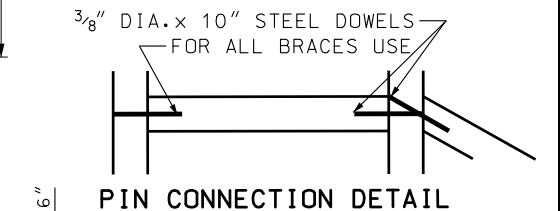


TYPE E

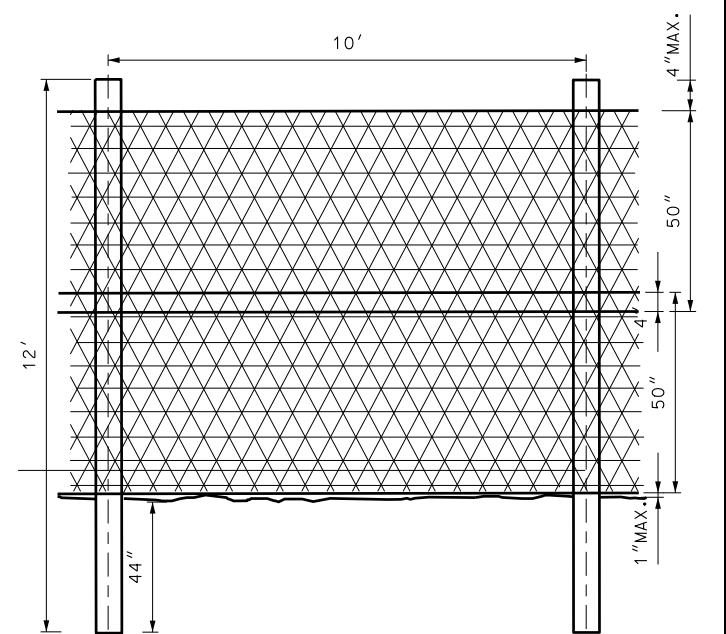
SPACING AND BRACING TYPE F THE SAME AS SHOWN IN TYPICAL INSTALLATION ABOVE. POST MAY BE 6' - 4" IN LENGTH.



TYPE F
TO BE INSTALLED IN
DEER COUNTRY



TYPICAL



(DEER BARRIER)
RIGHT OF WAY FENCE
TYPE G

TYPE G NOTES.

1. TIE OR CLAMP THE 50 inches TOGETHER EVERY 12 inches USING HOG RINGS OR OTHER TYPES OF TIES OR CLAMPS
2. PLACE BOTTOM WIRE NO MORE THEN 1 inch ABOVE THE GROUND, OR BURY IT AS NEEDED.

REVISIONS

NO.	DATE	APPR.	REMARKS

STATE DEPARTMENT OF TRANSPORTATION
STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION

RECOMMENDED FOR APPROVAL
CHAIRMAN STANDARDS COMMITTEE

DATE
JAN.01.2005

DATE
JAN.01.2005

DEPUTY DIRECTOR

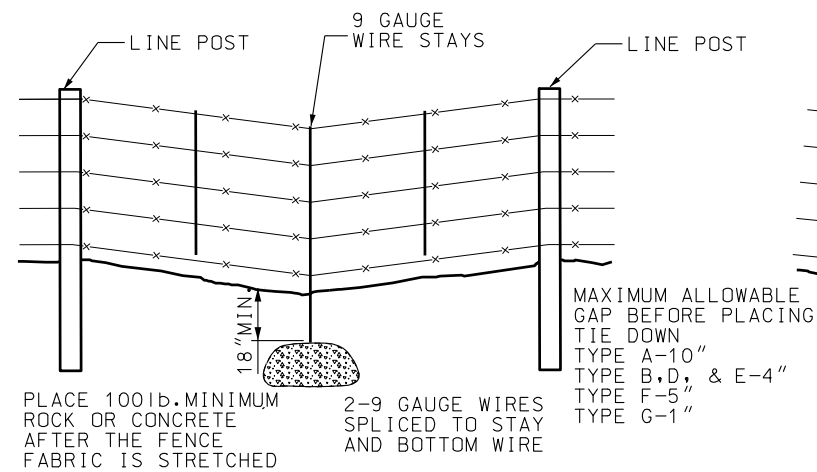
RIGHT OF WAY
FENCE AND GATES
(WOOD POST)

STANDARD DRAWING TITLE

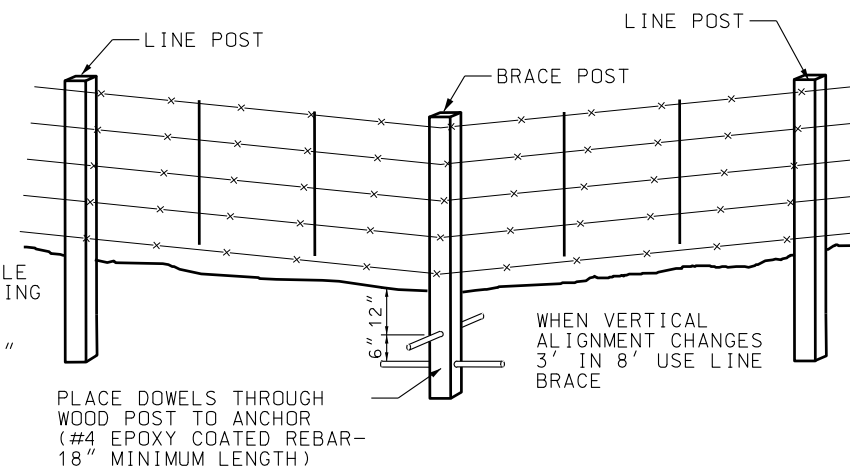
STD DWG
FG 1A

D:\N:\Standards\SpecSection\Standards Committee\MeetingFiles\2007\Apr1126.07Mtg Drawings\Fg1b.dgn 10-APR-2007

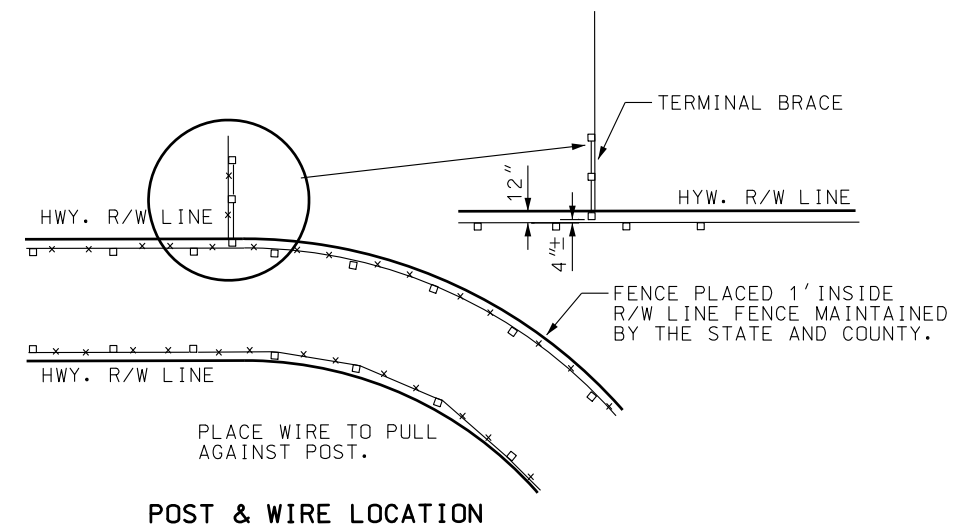
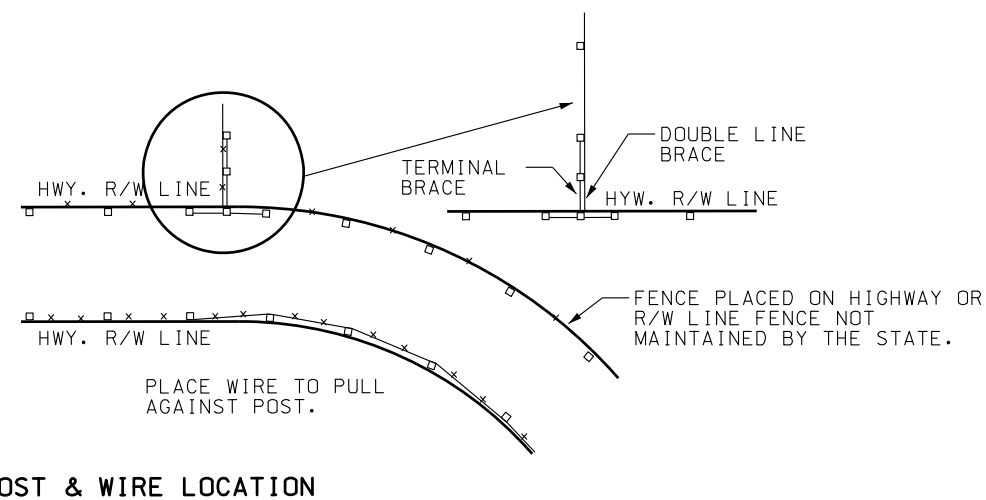
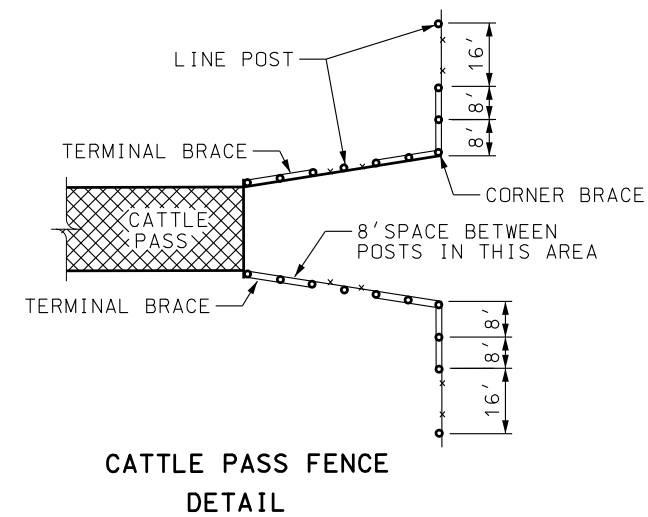
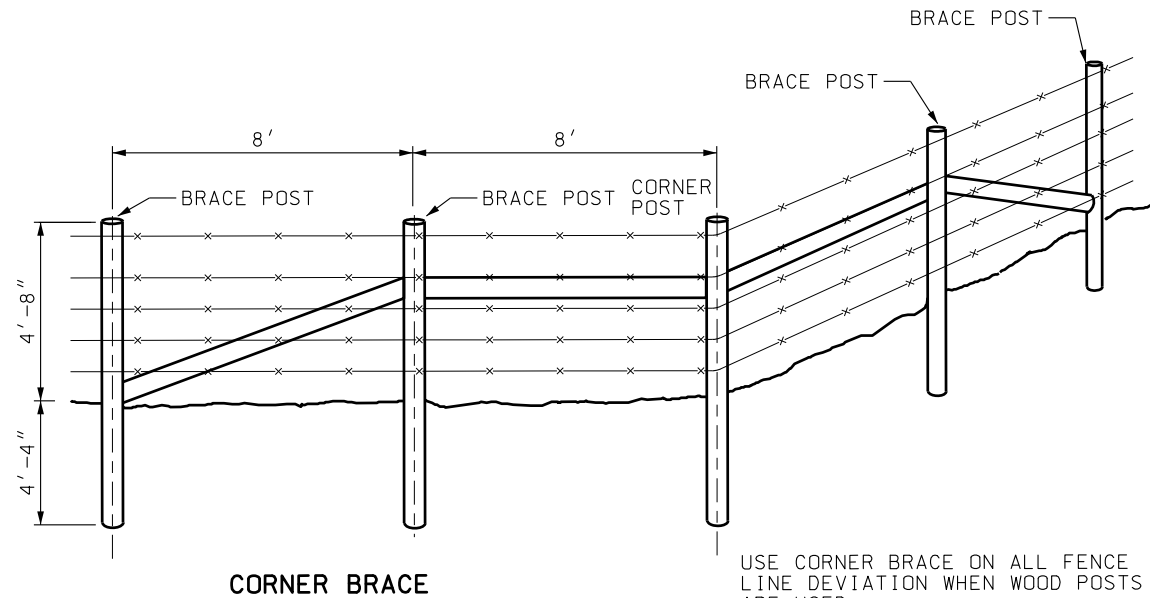
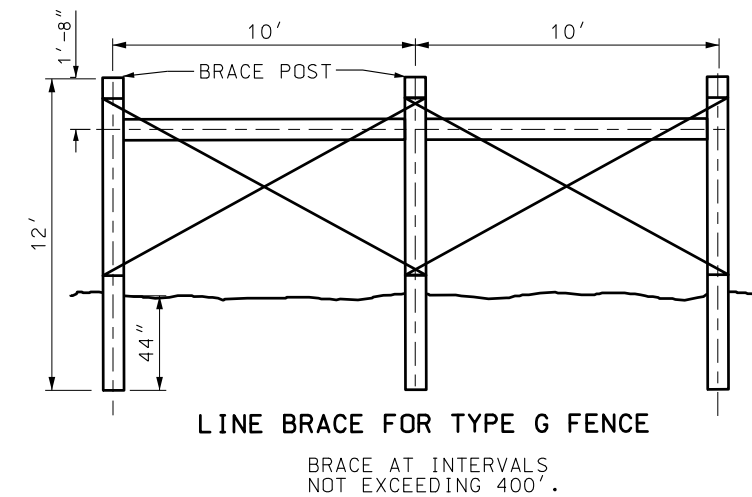
INSTALLATION WITH WOOD POSTS (TYPICAL.)



TYPICAL SAG SECTION



TYPICAL VERTICAL ALIGNMENT CHANGE



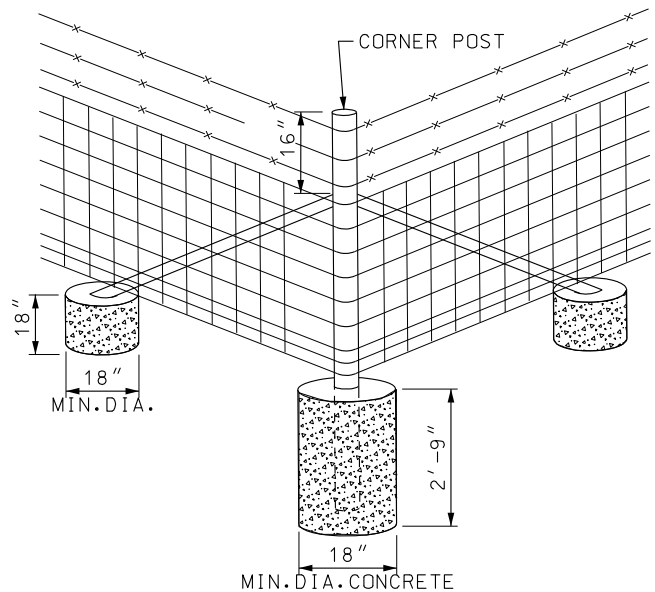
UTAH DEPARTMENT OF TRANSPORTATION
STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION
RECOMMENDED FOR APPROVAL

JAN. 01, 2005
DATE
JAN. 01, 2005
DATE
CHAIRMAN
STANDARD COMMITTEE
APPROVED
DEPUTY DIRECTOR

RIGHT OF WAY
FENCE AND GATES
(WOOD POST)

STANDARD DRAWING TITLE

STD DWG
FG 1B



REVISIONS			
NO.	DATE	APP.	REMARKS

~~UTAH DEPARTMENT OF TRANSPORTATION~~
~~STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION~~

SALT LAKE COUNTY
RECOMMENDED FOR APPROVAL

~~CHAIRMAN, STANDARDS COMMITTEE~~

APPROVED _____
CHIEF FINANCIAL OFFICER

DEPUTY DIRECTOR DATE

RIGHT OF WAY
FENCE AND GATES
(METAL POST)

STANDARD DRAWING TITLE

STD DWG
FG 2B

Standards Committee Submittal Sheet

Name of preparer: Wes Starkenburg

Title/Position of preparer: Pedestrian Safety Engineer

Specification/Drawing/Item Title: PEDESTRIAN ACCESS

Specification/Drawing Number: Drawings GW 5A, 5B, and 5C

Enter appropriate priority level:

(See last page for explanation)

3

Sheet not required on editorial or minor changes to standards. Check with Standards Section.

NOTES:

1. All Submittal Sheets must be completed and sent to the Standards and Specifications Section by the Standards Committee suspense date as shown on the Web.
(<http://www.udot.utah.gov/index.php/m=c/tid=303>)
2. The Preparer of the Submittal Sheet or the Standards Committee member (or authorized substitute) responsible for the submittal must be present at the Standards Committee meeting and capable of discussing and answering all questions related to the submittal. The item will be postponed to a later meeting if one of these people is not present.
3. Notify the Standards and Specifications Section immediately of any changes that impact the presentation to include absence of sponsor or delay in presentation.

Complete the following: (Use additional pages as needed.)

- A. Why? Detail the reason for changing the Standard (Specification or Drawing), what has initiated a new Standard, or what has caused a new or changed item of interest.

Some of the dimensioning has changed, e.g. edge of detector panels nearest the street must now be at or within 2" of the back of curb, vs. previous requirement that they be 6" to 8" from curb flow line. This will avoid errors in placement as the back of curb is a well know point, the curb flow line in not.

Added a detail for a parallel corner ramp illustrate new detail from APWA Standards.

Clarified thickness of concrete in ramp areas exposed to turning trucks.

Consolidated NOTES as GENERAL NOTES on Drawing GW 5A. Arranged notes so that notes repeated on GW 5B and GW 5C are numbered the same as on GW 5A.

Renamed "transition" to "clear area" to conform to ADA definitions.

Added a note that clarifies that grade breaks on ramps must be parallel to ramp running slope.

Added clear area detail covering an area where mistakes often occur.

Corrected minor drafting errors.

Moved details to provide room for new transition detail.

- B. How is Measurement and Payment handled? Existing (from the measurement and payment document), modified, or new measurement and payment to be included with all Standard Specifications or Supplemental Specifications.

No change to Measurement and Payment.

- C. Stakeholder Notification for AGC and ACEC:

By email provide the AGC and ACEC Standards Committee member a copy of all pertinent information relating to the specification or drawing. Detail all responses below. Indicate if no comments were received.

Sent 3/26/07

Note: There is a two-week response time set for this item. HOWEVER, I would appreciate it if you could respond by April 4, 2007 so this can be included in the April 26, 2007 meeting

Refer to the Standards Committee Web site, Members page at <http://www.udot.utah.gov/index.php/m=c/tid=659> for the respective e-mail addresses.

AGC Comments: (Use as much space as necessary.)

No comments received. These changes are not likely to affect contractors much.

ACEC Comments: (Use as much space as necessary.)

1. GW 5A: Why not delete note 4, and just label the curb cut "25% MAXIMUM SLOPE" wherever it says "SEE NOTE 4". This comment applies to the other sheets as well. Done.

2. Note 5 reads "CORER", and should read "CORNER." Corrected

3. GW 5B: Note 3 instructs that the detectable warning surface should be against the curb, yet the examples show the detectable warning surfaces not following the curvature of the curb. Also on the single corner pedestrian ramp, one example shows the detectable warning surface only touching the curb with one corner, which is totally not in accordance with NOTE 3. My feeling is that note 3 should be done away with- it creates a constructability issue, and I doubt that impaired

people who make use of the warning surface would mind if it was placed a few inches behind the curb (my opinion). In other words, does it really make a difference? Perhaps I do not understand the issue here.

The ADA requirements result in the position of the panel as shown. We must comply with their regulations.

4. In NOTE 1 on GW 5B and GW 5C the space between the "5" and the "A" should be deleted. Done

- D. Stakeholders? From the list provided, document the stakeholders contacted, detailing: the company, name of contact, how contacted (by phone, email, hard copy, or in person), concerns, and comments of the change. Stakeholders:

Note: There is a two-week response time set for this item. Allow Stakeholders two weeks to process and respond to coordination requests. All areas should try to complete review and comment as soon as possible but within two weeks.

In-house (for example, preconstruction, materials, construction, safety, design, maintenance) (Include all applicable in-house areas even if not listed above.)

Statewide Area Supervisors	Responded?	Comments	Resolution
To: A J Rogers	No		
To: Bill Smith	Yes	No Comments	
To: Brent Christensen	No		
To: Dave Babcock	Yes	No Comments	
To: Dave Miller	No		
To: Ervan Rhoades	No		
To: Jack Mason	Yes	No Comments	
To: Layne Slack	No		
To: Les Henrie	No		
To: Norton Thurgood	No		
To: Patrick McGann	No		
To: Ree Schena	No		
To: Rick Debban	No		
To: Robert Nebeker	No		
To: Steven Acerson	No		
To: Todd Richins	Yes	No Comments	
To: Val Stoker	No		

Construction, Complex	Responded?	Comments	Resolution
Cc: Darrell Giannonatti	No		
Cc: Peter Negus	No		
Cc: Stan Adams	No		

Construct/Maint Engrs	Responded?	Comments	Resolution
To: Betty Purdie	No		
To: Bret Sorenson	No		
To: Clark Mackay	Yes	Correct misspelled "Corner"	Done
		Add – to neg slopes	No. Slopes can be + or -
		GW 5C Note 2 remove 2 nd line	Done
To: Dennis Simper	No		
To: Kevin Griffin	No		
To: Nathan Merrill	No		
To: Rob Wight	No		
To: Robert Westover	No		
To: Scott Andrus	No		
To: Scott Nussbaum	No		
To: Steve Ogden	No		
Cc: Lynn Bernhard	No		

Region Directors and District Engineers	Responded?	Comments	Resolution
To: Hugh Kirkham	Yes	No Comments	
To: Robert Dowell	No		
To: Scott Munson	No		
Cc: Cory Pope	No		
Cc: Dal Hawks	No		
Cc: David Nazare	No		
Cc: Jason Davis	No		
Cc: Scott Nussbaum	Yes	Will these changes make recently constructed ramps out of date and subject to replacement?	No. Changes only clarify previous requirements.

Region and Complex Permit Officers	Responded?	Comments	Resolution
To: Barry Sawsak	No		
To: Dale Stapley	No		
To: Justin Sceili	No		
To: Mark Velasquez	No		
To: Marsha Chaston	No		
To: Nancy Jerome	No		
To: Scott Snow	No		
To: Steve Kunzler	No		
To: Teri Peterson	No		
To: Tommy Vigil	No		

Region Preconstruction Engineers	Responded	Comments	Resolution
To: Bill Lawrence	Yes	No comment, forwarded to designer squads	
To: Brent Schvaneveldt	Yes	No Comments	
To: Mike Miles			
To: Nathan Peterson			

Project Managers	Responded?	Comments	Resolution
To: Adamson, David	No		
To: Booth, Teresa	No		
To: Clarkson, John	No		
To: Dabbling, Lori	No		
To: Daniel Young	No		
To: Friant, Daryl	No		
To: Fristrup, Darin	No		
To: Gooch, Bill	No		
To: Haskell, Craig	No		
To: Higgins, John	No		
To: Huff, Philip	No		
To: Humphreys, Brad	No		
To: Kergaye, Cameron	No		
To: Mace, Charles	No		
To: Manwill, Kim	No		
To: Maxwell, Tamerha	No		
To: Montoya, John	No		
To: Newell, TeriAnne	No		
To: Rasmussen, Marjorie	No		
To: Tang, Peter	No		
To: Taylor, Ritchie	No		
To: Thornock, Kirk	No		

To: Wilson, Lisa	No		
----------------------------------	----	--	--

Senior Project Managers	Responded?	Comments	Resolution
To: Joe Kammerer	Yes	Forwarded to Bill Lawerice, Design	
To: Merrell Jolley	Yes	Forwarded to Brent Schanefeldt & Steve Park, Design	
To: Nathan Lee	Yes	Forwarded to Nathan Peterson, Design	
To: Rick Torgerson	No		

Resident Engineers	Responded?	Comment	Resolution
To: Dallas Linford			
To: Darren Rosenstein			
To: Deryl Mayhew			
To: Fred Jenkins			
To: Greg Searle			
To: Jack Lyman			
To: Jim Golden			
To: Jim McConnell	Yes	Show 25% slope as max	Done
To: Josh VanJura			
To: Kelly Barrett	Yes	Show 6" thickness for concrete	Done
To: Lonnie Marchant			
To: Lyndon Friant	Yes	Add pay limits to Drawings	No, pay by square foot.
To: Marwan Farah			
To: Michelle Page			
To: Mike Seng			
To: Nick Peterson			
To: Russ Tangren			
To: Steven Niebergall			

Traffic & Safety	Responded?	Comments	Resolution
To: Carrie Jacobson			
To: Danielle Herrscher			
To: Darin Duersch			
To: Dave Kinnecom			
To: Doug Bassett	Yes	No comments	
To: Glen Ames			
To: Glenn Schulte			
To: John Leonard			
To: Kris Peterson			
To: Larry Montoya			
To: Mike Donovan			

To: Rob Clayton	Yes	Lower left GW5B, show warp goes length of ramp	Done
		GW5A Show width of sidewalk for perpendicular ramp	No. During layout , this or other ramp will be selected depending on sidewalk width
To: Robert Markle			
To: Troy Peterson			
To: Troy Torgersen			
To: W. Scott Jones			
Cc: Roland Stanger			
To: Anne Ogden	Yes	Label 6" concrete as 6" thick	Done
		Label 3" UTBC as thickness.	No, arrow points to UTBC. This is std notation.
		Gutter pan is not labeled	No. This is standard notation.
		Change "grind" knobs t "grind off"	Done
		Label full height curbs	Done
		Label sidewalk and cross on lower left detail	No. Detail is similar to adjacent detail
		Change "curb line" to "flow line"	Done
		Is there a max or min to provide "constant running slope"	No
		Include Dwg # for plowable end details	Done
		Numerous drafting errors.	All done

FHWA	Responded?	Comments	Resolution
Cc: Roland Stanger	Yes	Add Note "Grade breaks on ramps must be perpendicular to running slope"	Done
		Change Note 1 to read like APWA standards	Done

Contractors (Any additional contacts beyond "C" above.)

None. AGC review should be sufficient.

Suppliers.

None.

No effect on suppliers.

Consultants (as required) (Any additional contacts beyond "C" above.)

None. AGEC review should be sufficient.

FHWA (To be accomplished as part of the two-week process before submitting to the Standards and Specifications Section for inclusion on the Standards Committee agenda.) (This is in addition to the requirements of UDOT Policy 08A5-1, procedure 08A5-1.3.)

FHWA	Responded?	Comments	Resolution
Cc: Roland Stanger	Yes	Add Note "Grade breaks on ramps must be perpendicular to running slope"	Done
		Change Note 1 to read like APWA standards	Done

Others (as appropriate)

None.

- E. Other impacted areas, systems, or personnel. (Consider all impacts and possible changes to these areas during the preparation process. Coordinate with all appropriate areas for the respective item. List all impacts and action taken.)

1. Minimum Sampling and Testing Guide (MS&T Guide)

No impact.

2. Business Systems (Electronic Bid System, Project Development Business System, Electronic Program Management, Computer-Aided Drafting and Design, etc.)

No impact.

3. Implementation Plan (Provide detailed instructions on how the subject item will be implemented to include notification of all interested parties and training requirements.)

If approved, revised drawings will be posted on UDOT Standards website.

- F. Costs? (Estimates are acceptable.)

1. Additional costs to average bid item price.

None.

No detectable change in cost. Most changes do not affect construction costs, some may add minor costs, some may provide minor reductions.

2. Operational (For example, maintenance, materials, equipment, labor, administrative, programming).

None.

No detectable change in operational costs.

3. Life cycle cost.

No change.

- G. Benefits? (Provide details that can be used to complete a Cost – Benefit Analysis.) (Estimates are acceptable.) (If no costs, what is the benefit of making this change?)

The benefits are: conforming to current standards, clarifying requirements, and correcting errors.

- H. Safety Impacts?

None.

- I. History? Address issues relating to the current usage of the item and past reviews, approvals, and/or disapprovals.

Adding transition detail should alleviate errors in transition areas.

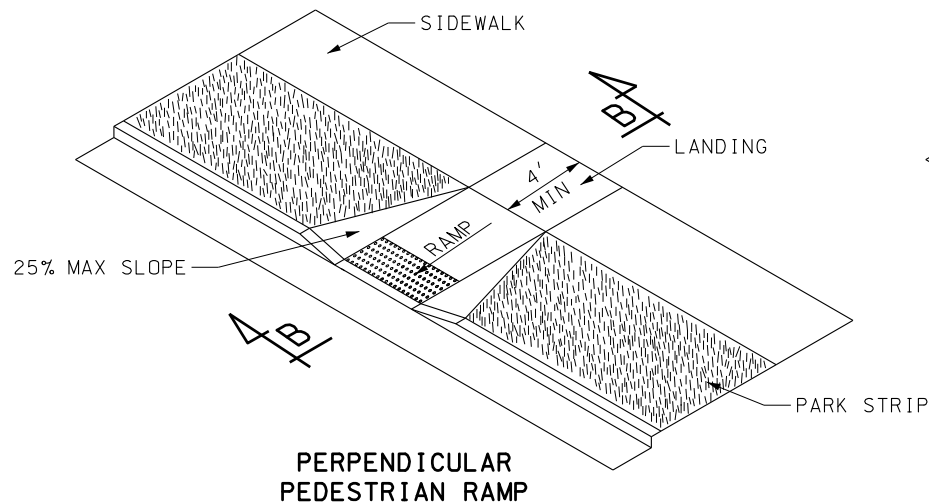
No past reviews of these changes.

Priority Explanation

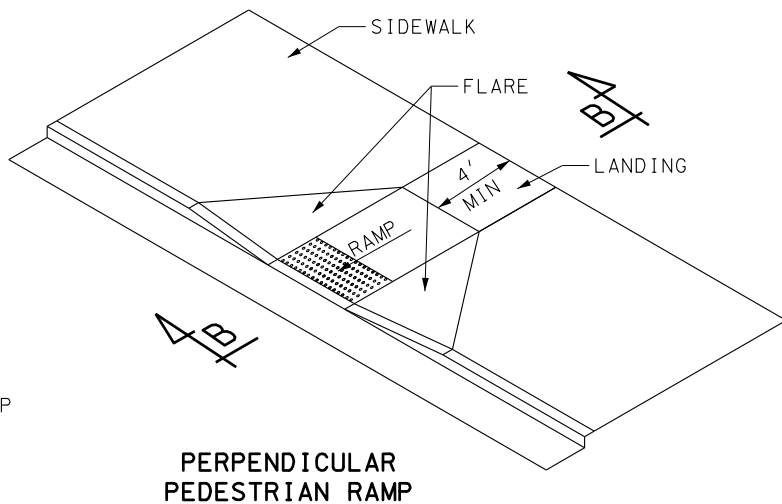
Enter the appropriate priority in the box on the first page of the document.

- | | |
|------------|---|
| Priority 1 | Upon posting, this impacts all projects in construction and design with a Change Order, Addenda, and immediate change to projects being advertised. |
| Priority 2 | Upon posting, this impacts projects being advertised. |
| Priority 3 | Upon posting, the approved standard takes effect four weeks later for projects being advertised. |

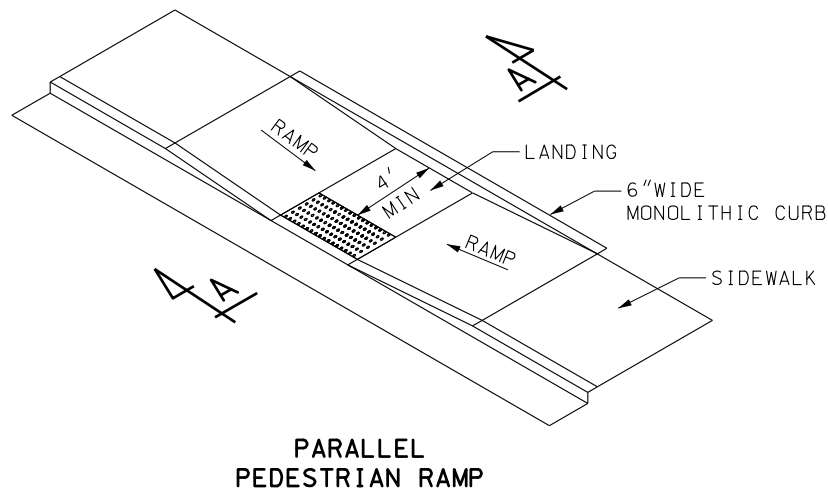
D:\10-APR-2007\10-APR-2007\Standards\Standards Committee\Meeting\Files\2007\April\26_07\Stdg Drawings\GW5A.dgn



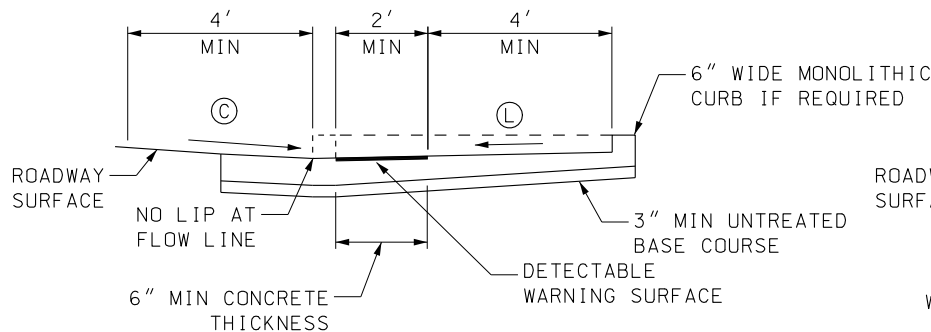
PERPENDICULAR
PEDESTRIAN RAMP



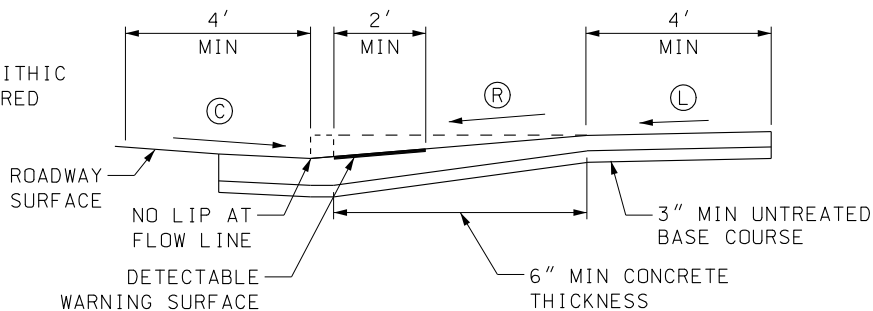
PERPENDICULAR
PEDESTRIAN RAMP



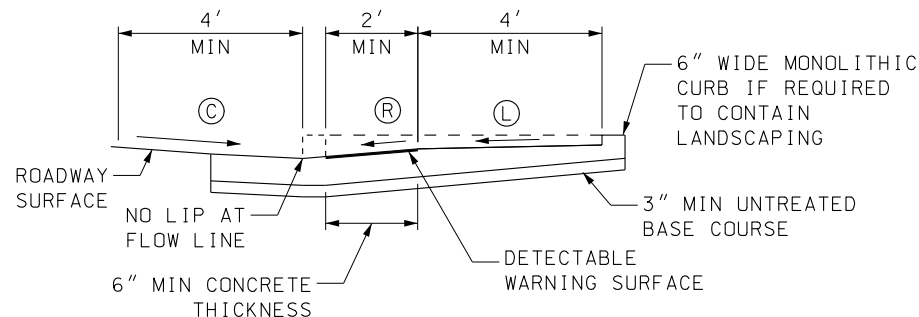
PARALLEL
PEDESTRIAN RAMP



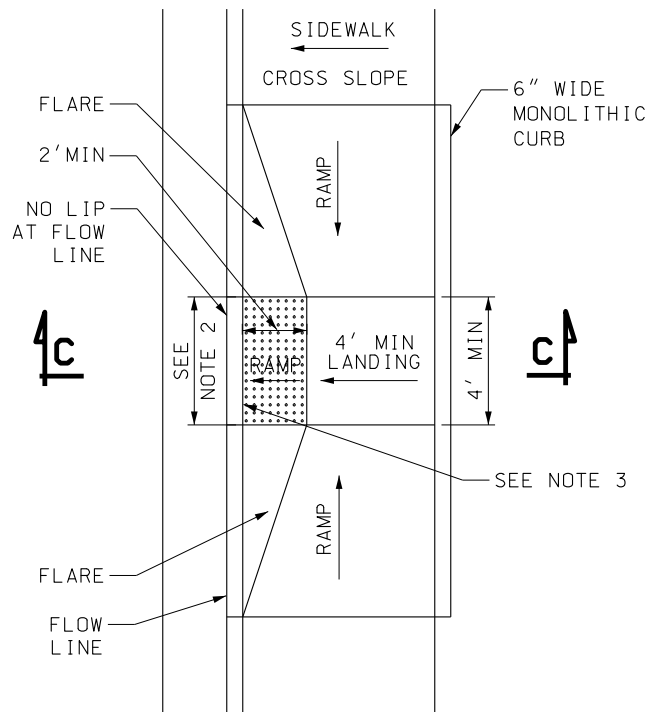
SECTION A-A



SECTION B-B



SECTION C-C



PEDESTRIAN ACCESS
RAMP DETAIL

SLOPE TABLE			
	ITEM	MAX. RUNNING SLOPE *	MAX. CROSS SLOPE *
(L)	LANDING	2% (1V:48H) (b)	2% (1V:48H) (b)
(R)	RAMP	8.33% (1V:12H) (c)	2% (1V:48H) (d)
(C)	CLEAR SPACE	5% (1V:20H) (a)	2% (1V:48H) (d)
	SIDEWALK	--	2% (1V:48H)
	FLARE	10% (1V:10H)	--

- * RUNNING SLOPE IS IN THE DIRECTION OF PEDESTRIAN TRAVEL. CROSS SLOPE IS PERPENDICULAR TO PEDESTRIAN TRAVEL.
- (a) TRANSITION RUNNING SLOPE NEEDS TO BE CONSISTENT ACROSS ENTIRE CURB CUT. WARP GUTTER PAN TO MEET REQUIRED TRANSITION SLOPE AT CURB CUT.
- EXCEPTIONS:
- (b) SLOPE REQUIREMENTS DO NOT APPLY AT MID-BLOCK CROSSINGS.
- (c) PARALLEL RAMPS ARE NOT REQUIRED TO EXCEED 15-FEET IN LENGTH.
- (d) CROSS SLOPE REQUIREMENT DOES NOT APPLY AT PERPENDICULAR RAMP MID-BLOCK CROSSING.

GENERAL NOTES:

1. SITE CONDITIONS WILL VARY. CONFIGURATION OF RAMP, LANDING, AND TRANSITION MAY BE CHANGED, BUT THEY MUST MEET DIMENSIONS AND SLOPES SHOWN HERE. THE USE OF FLARES, CURBWALLS, ETC. ARE AT THE DISCRETION OF THE ENGINEER.
2. PROVIDE DETECTABLE WARNING SURFACE FOR FULL WIDTH OF CURB CUT. SEE DETAIL A ON GW 5C FOR DETECTABLE WARNING SURFACE DIMENSIONS.
3. LOCATE DETECTABLE WARNING SURFACE SO THE EDGE NEAREST THE STREET IS AT OR WITHIN 2" OF THE BACK OF CURB.
4. PERPENDICULAR AND PARALLEL PEDESTRIAN RAMPS SHOWN ON THIS DRAWING ARE ACCEPTABLE FOR USE AT MID-BLOCK OR CORNER INSTALLATIONS. REFER TO STD DWG GW 5B AND GW 5C FOR EXAMPLES OF CORNER INSTALLATIONS.
5. PROVIDE DETECTABLE WARNING SURFACE COLOR THAT CONTRASTS WITH ADJACENT WALKING SURFACE, EITHER LIGHT-ON-DARK OR DARK-ON-LIGHT. ACCEPTABLE COLORS INCLUDE: RED, BLACK, OR YELLOW.
6. USE CLASS AA(AE) CONCRETE.
7. USE UNTREATED BASE COURSE UNDER ALL CONCRETE FLATWORK.
8. WHEN DETECTABLE WARNING SURFACE IS CUT, GRIND OFF REMAINING PORTION OF ANY CUT DOMES. SEAL ALL CUT PANEL EDGES TO PREVENT WATER DAMAGE.
9. LOCATE CURB CUT WITHIN CROSSWALK.
10. RAMP GRADE BREAK MUST BE PERPENDICULAR TO THE RUNNING SLOPE.

UTAH DEPARTMENT OF TRANSPORTATION

STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION

RECOMMENDED FOR APPROVAL

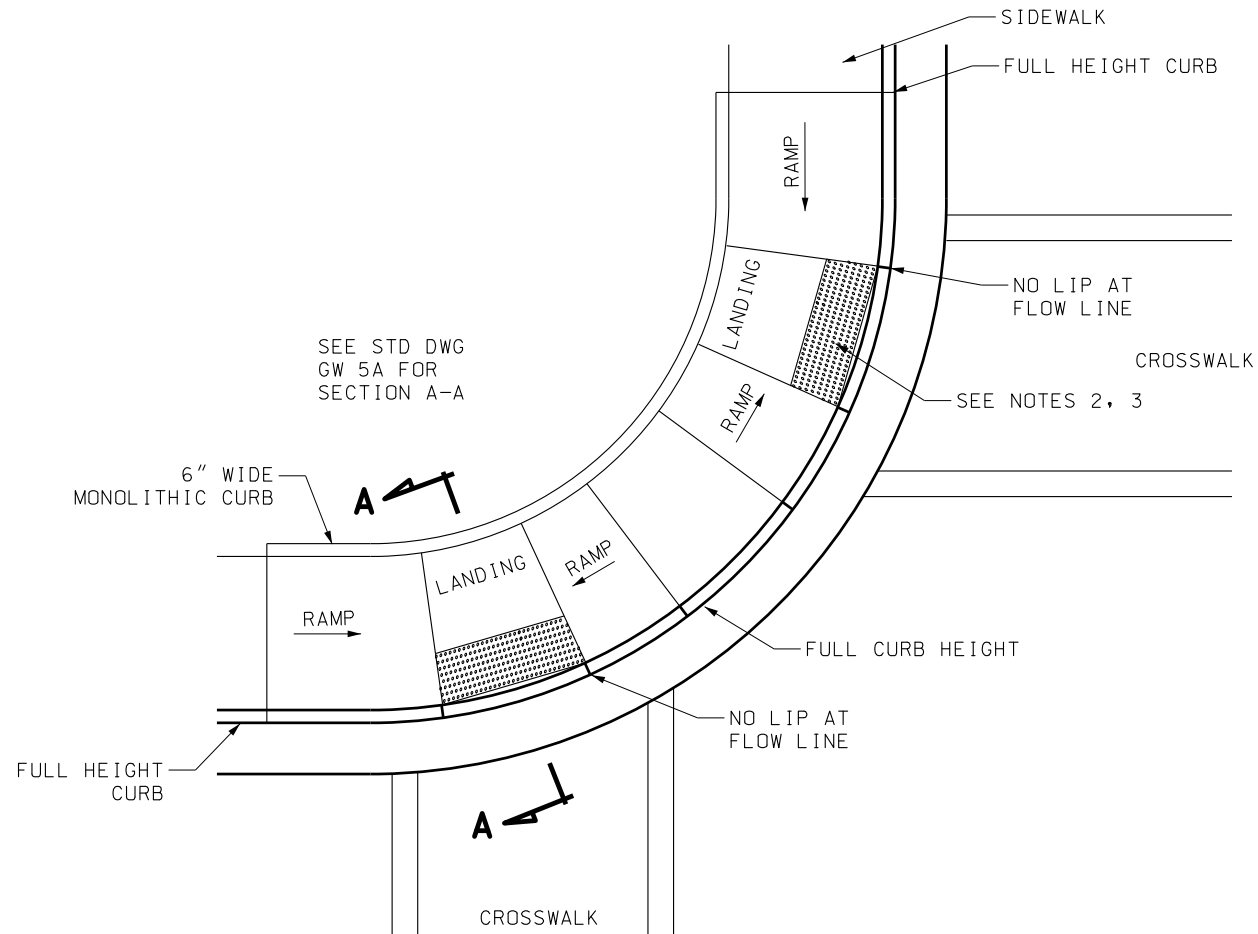
CHAIRMAN STANDARDS COMMITTEE

DEPUTY DIRECTOR

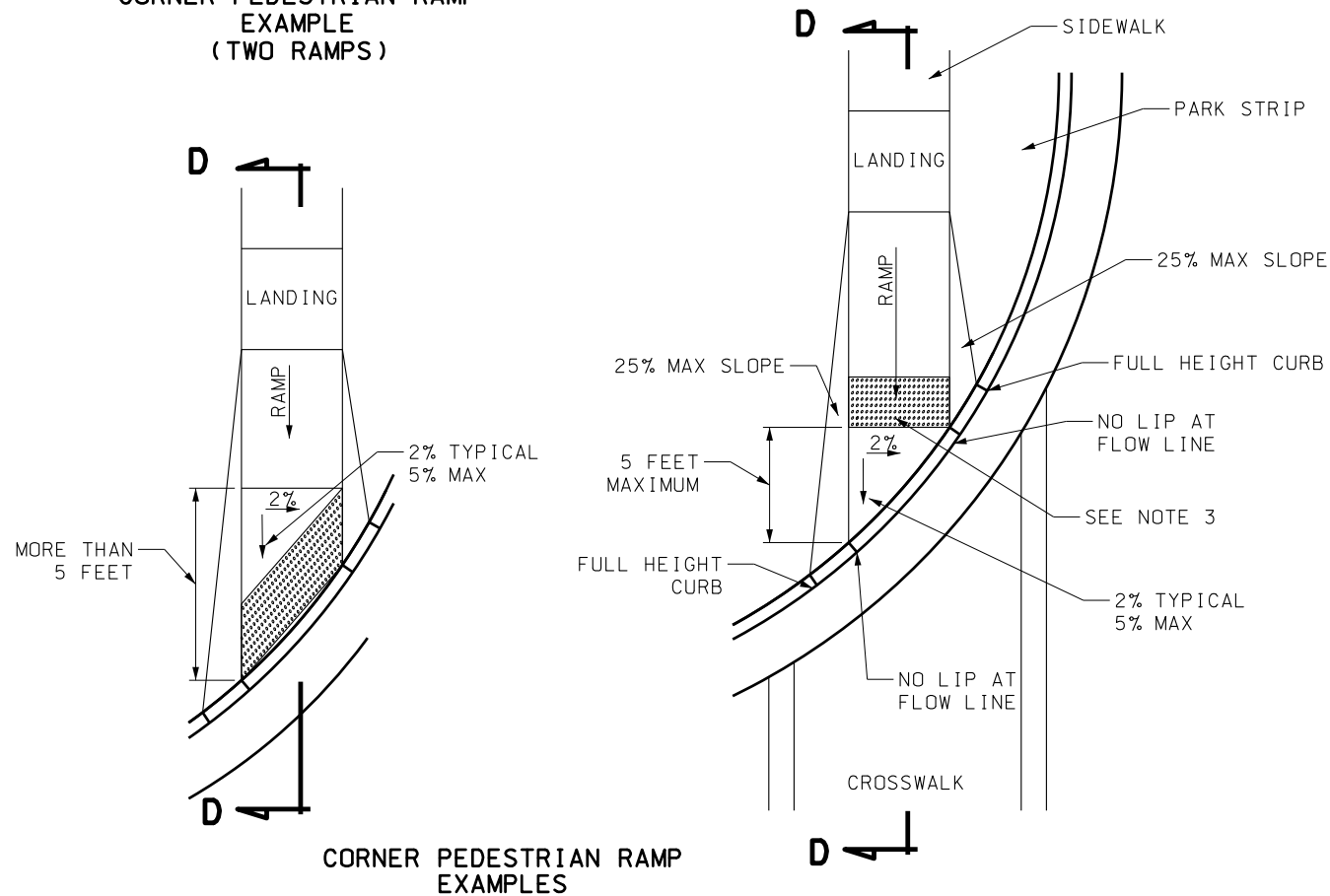
PEDESTRIAN ACCESS

STD DWG
GW 5A

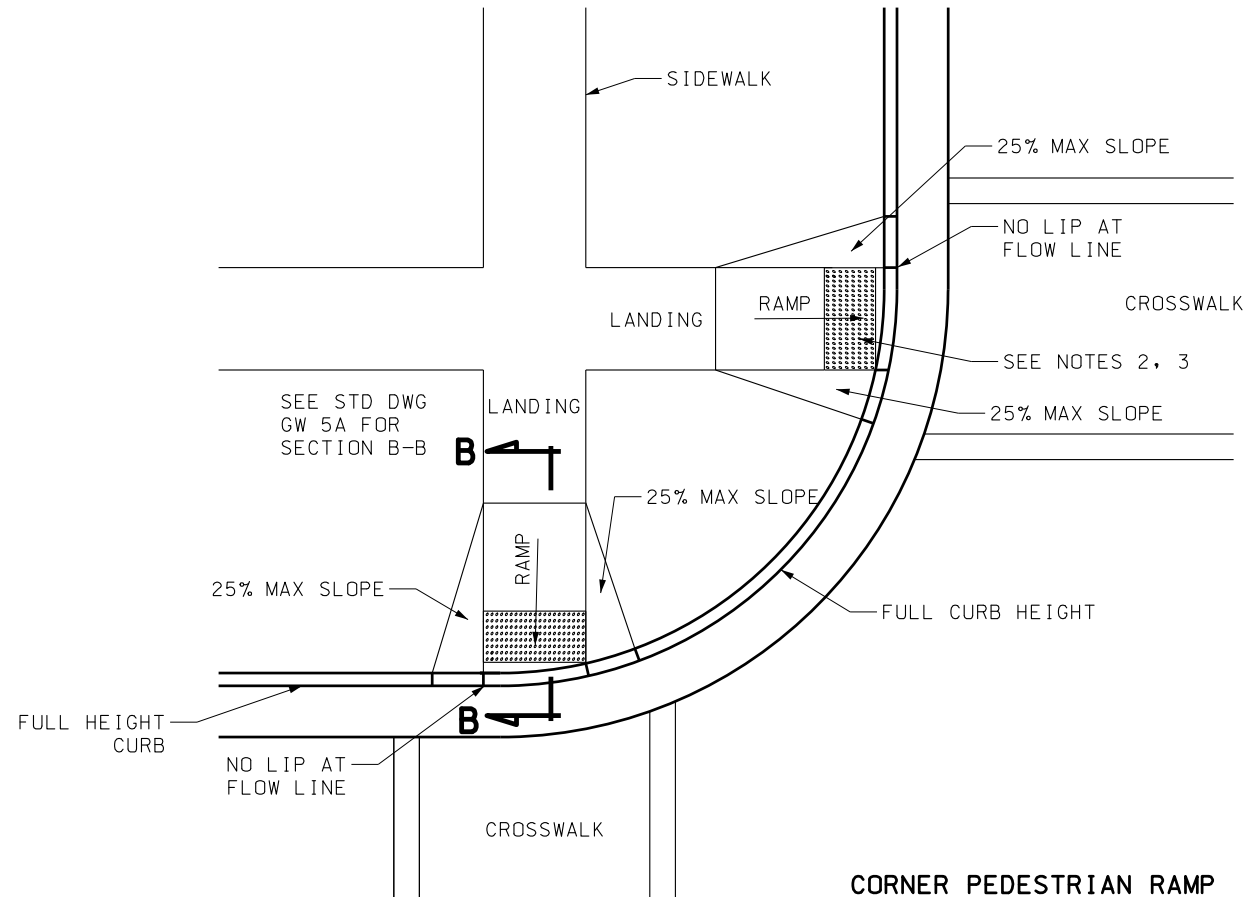
STANDARD DRAWING TITLE



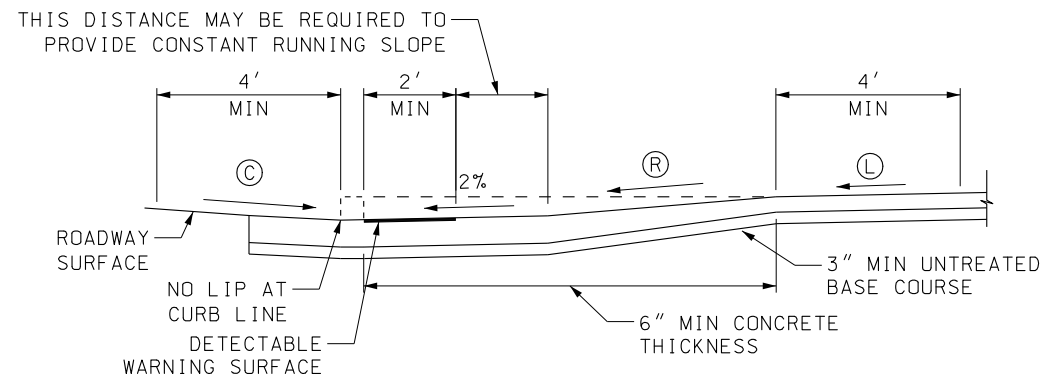
CORNER PEDESTRIAN RAMP
EXAMPLE
(TWO RAMPS)



CORNER PEDESTRIAN RAMP
EXAMPLES



CORNER PEDESTRIAN RAMP
EXAMPLE
(TWO RAMPS)



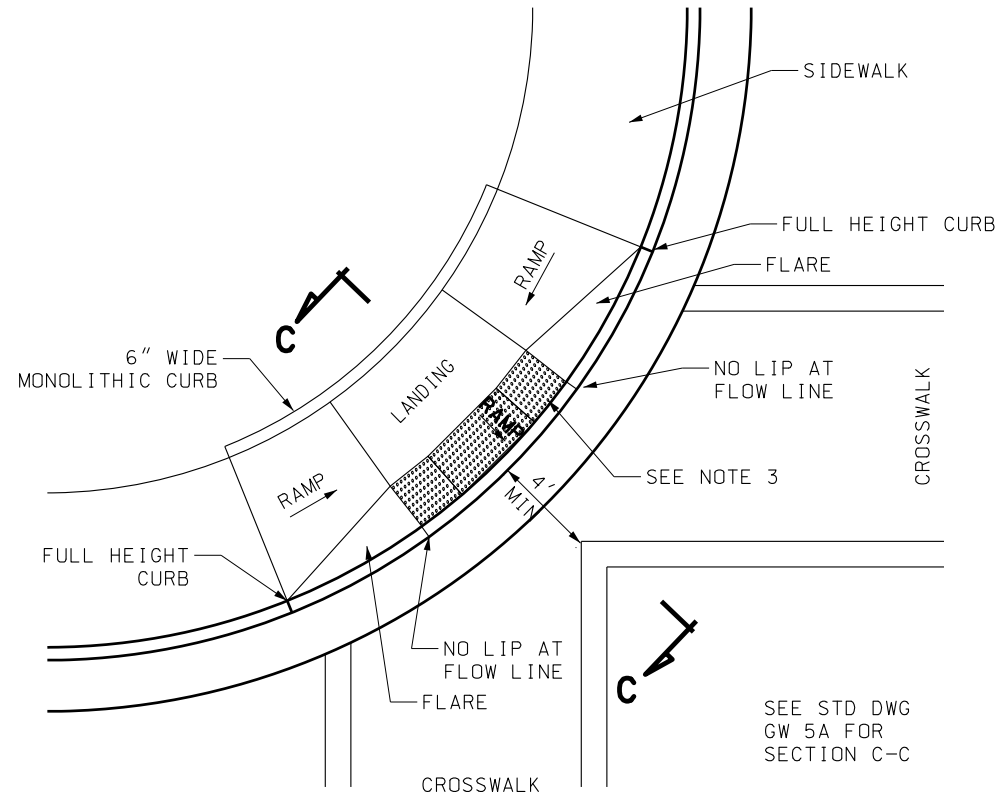
SECTION D-D

NOTES:

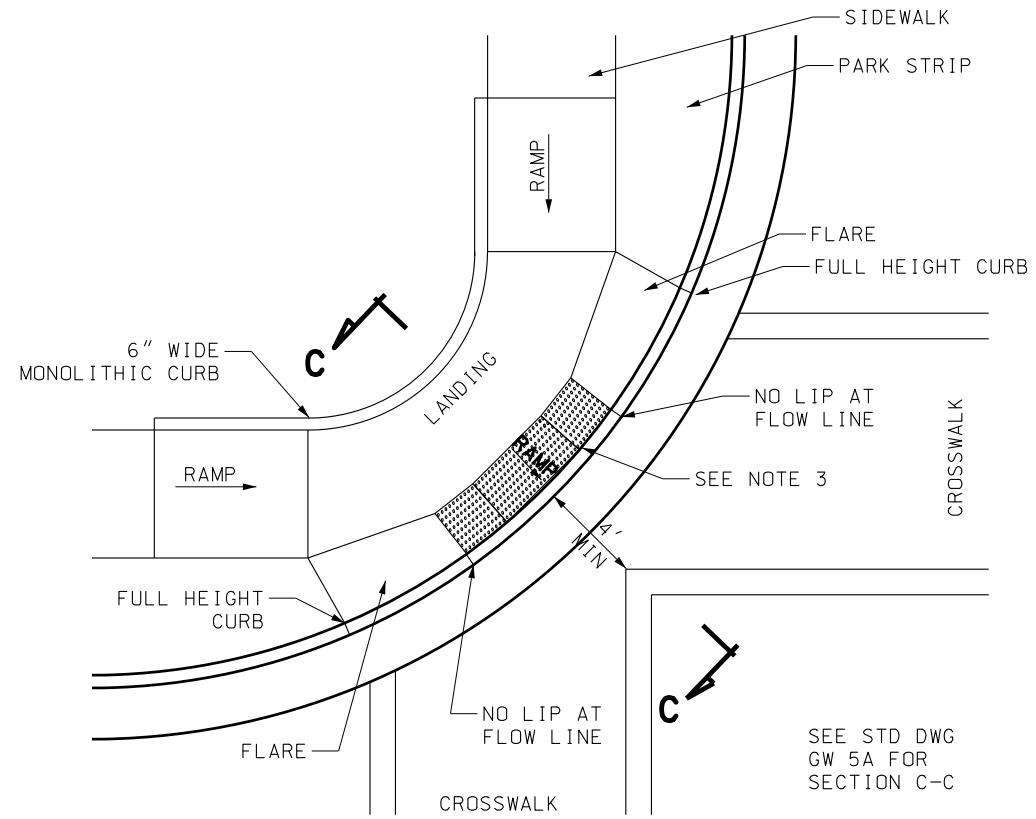
1. REFER TO STD DWG GW 5A FOR GENERAL NOTES AND SLOPE TABLES.
2. PROVIDE DETECTABLE WARNING SURFACE FOR FULL WIDTH OF CURB CUT. SEE DETAIL A ON GW 5C FOR DETECTABLE WARNING SURFACE DIMENSIONS.
3. LOCATE DETECTABLE WARNING SURFACE SO THE EDGE NEAREST THE STREET IS AT OR WITHIN 2" OF THE BACK OF CURB.
4. RAMP GRADE BREAK MUST BE PERPENDICULAR TO THE RUNNING SLOPE.

PEDESTRIAN ACCESS	STD DWG GW 5B	STANDARD DRAWING TITLE	UTAH DEPARTMENT OF TRANSPORTATION STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION SAINT JARVIS CITY, ILL.				REVISIONS			
			RECOMMENDED FOR APPROVAL				1	06/30/05	L.M.	CORNER PEDESTRIAN RAMP EXAMPLE DETAIL MODIFIED.
			CHAIRMAN STANDARDS COMMITTEE				2	02/23/06	L.M.	SECTION A-A, B-B, AND C-C MODIFIED TO CLARIFY 1" DIMENSION.
			APPROVED				3	03/22/07	W.S.	MODIFIED CORNER PEDESTRIAN RAMP (TWO RAMPS), ADDED CORNER PEDESTRIAN RAMP, MODIFIED NOTES TO GW 5A.
			DEPUTY DIRECTOR							
			FEB.23.2006							
			DATE							
			FEB.23.2006							
			DATE							
			FEB.23.2006							
DATE										
FEB.23.2006										
DATE										
FEB.23.2006										
DATE										
FEB.23.2006										
DATE										
FEB.23.2006										
DATE										
FEB.23.2006										
DATE										
FEB.23.2006										
DATE										
FEB.23.2006										
DATE										
FEB.23.2006										
DATE										
FEB.23.2006										
DATE										
FEB.23.2006										
DATE										
FEB.23.2006										
DATE										
FEB.23.2006										
DATE										
FEB.23.2006										
DATE										
FEB.23.2006										
DATE										
FEB.23.2006										
DATE										
FEB.23.2006										
DATE										
FEB.23.2006										
DATE										
FEB.23.2006										
DATE										
FEB.23.2006										
DATE										
FEB.23.2006										
DATE										
FEB.23.2006										
DATE										
FEB.23.2006										
DATE										
FEB.23.2006										
DATE										
FEB.23.2006										
DATE										
FEB.23.2006										
DATE										
FEB.23.2006										
DATE										
FEB.23.2006										
DATE										
FEB.23.2006										
DATE										
FEB.23.2006										
DATE										
FEB.23.2006										
DATE										
FEB.23.2006										
DATE										
FEB.23.2006										
DATE										
FEB.23.2006										
DATE										
FEB.23.2006										
DATE										
FEB.23.2006										
DATE										
FEB.23.2006										
DATE										
FEB.23.2006										
DATE										
FEB.23.2006										
DATE										
FEB.23.2006										
DATE										
FEB.23.2006										
DATE										
FEB.23.2006										
DATE										
FEB.23.2006										
DATE										
FEB.23.2006										
DATE										
FEB.23.2006										
DATE										
FEB.23.2006										
DATE										
FEB.23.2006										
DATE										
FEB.23.2006										
DATE										
FEB.23.2006										
DATE										
FEB.23.2006										
DATE										
FEB.23.2006										
DATE										
FEB.23.2006										
DATE										
FEB.23.2006										
DATE										
FEB.23.2006										
DATE										
FEB.23.2006										
DATE										
FEB.23.2006										
DATE										
FEB.23.2006										
DATE										
FEB.23.2006										
DATE										
FEB.23.2006										
DATE										
FEB.23.2006										
DATE										
FEB.23.2006										
DATE										
FEB.23.2006										
DATE										
FEB.23.2006										
DATE										
FEB.23.2006										
DATE										
FEB.23.2006										
DATE										
FEB.23.2006										
DATE										
FEB.23.2006										
DATE										
FEB.23.2006										
DATE										
FEB.23.2006										
DATE										
FEB.23.2006										
DATE										
FEB.23.2006										
DATE										
FEB.23.2006										
DATE										
FEB.23.2006										
DATE										
FEB.23.2006										
DATE										
FEB.23.2006										
DATE										
FEB.23.2006										
DATE										
FEB.23.2006										
DATE										
FEB.23.2006										
DATE										
FEB.23.2006										
DATE										
FEB.23.2006										
DATE										
FEB.23.2006										
DATE										
FEB.23.2006										
DATE										
FEB.23.2006										

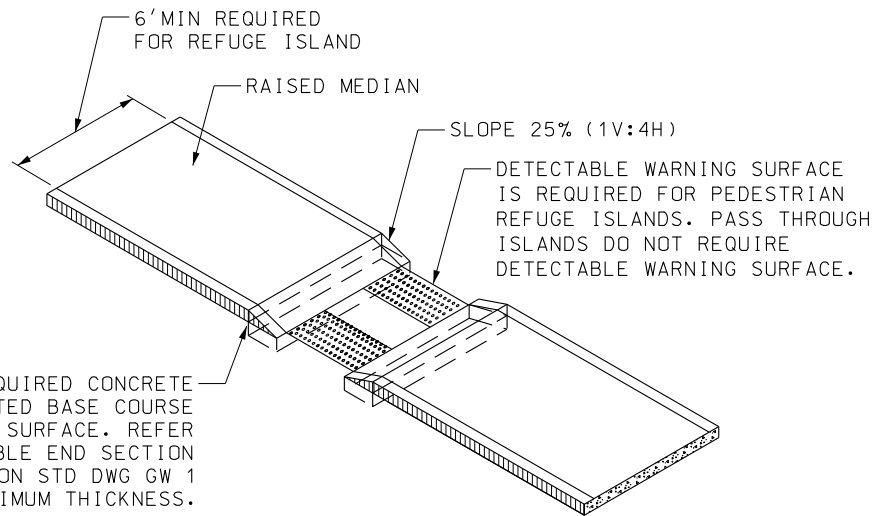
DGN File: 0:\Standards\SpecSection\Standards Committee\MeetingFiles\2007\April\26_07Mtg Drawings\GW5C.dgn 10-APR-2007



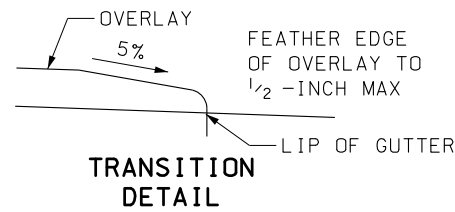
CORNER PEDESTRIAN RAMP EXAMPLE



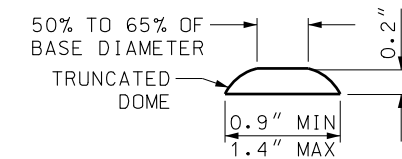
CORNER PEDESTRIAN RAMP EXAMPLE



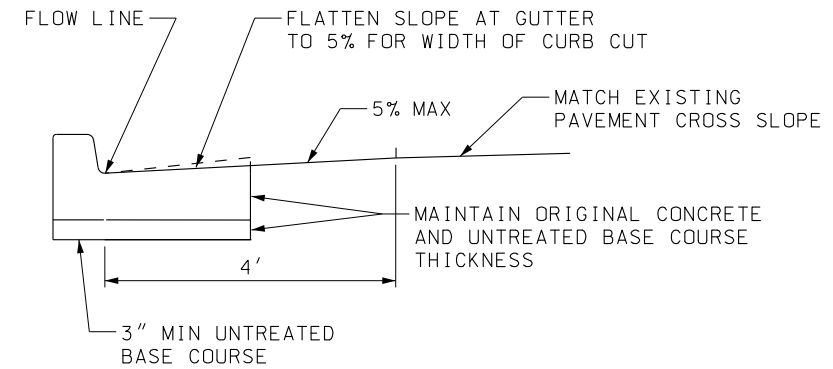
MEDIAN BREAK EXAMPLE



TRANSITION DETAIL



DETECTABLE WARNING SURFACE DETAIL A



CLEAR SPACE DETAIL

NOTES:

1. REFER TO STD DWG GW 5A FOR GENERAL NOTES AND SLOPE TABLES.
2. PROVIDE DETECTABLE WARNING SURFACE FOR FULL WIDTH OF CURB CUT.
3. LOCATE DETECTABLE WARNING SURFACE SO THE EDGE NEAREST THE STREET IS AT OR WITHIN 2" OF THE BACK OF CURB.
4. RAMP GRADE BREAK MUST BE PERPENDICULAR TO THE RUNNING SLOPE.

REVISIONS		NO.	DATE	APPR.	REMARKS
1	06/30/05	L.M.	MEDIAN BREAK EXAMPLE MODIFIED.		
2	03/22/07	W.S.	ADDED TRANSITION DETAIL & DETAIL A, MODIFIED NOTES		
			CORNER PEDESTRIAN RAMP NOTES MODIFIED.		

UTAH DEPARTMENT OF TRANSPORTATION		STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION		DATE	
RECOMMENDED FOR APPROVAL		JUN.30, 2005		DATE	
CHAIRMAN STANDARDS COMMITTEE		JUN.30, 2005		DATE	
APPROVED		JUN.30, 2005		DATE	
DEPUTY DIRECTOR					

PEDESTRIAN ACCESS		STANDARD DRAWING TITLE	
-------------------	--	------------------------	--

STD DWG	GW 5C
---------	-------

Standards Committee Submittal Sheet

Name of preparer: John Leonard
Title/Position of preparer: Traffic and Safety Operations Engineer
Specification/Drawing/Item Title: Standard Drawing PV 8
Specification/Drawing Number: Rumble Strips, Centerline Application

Enter appropriate priority level:

(See last page for explanation) 3

Sheet not required on editorial or minor changes to standards. Check with Standards Section.

NOTES:

1. All Submittal Sheets must be completed and sent to the Standards and Specifications Section by the Standards Committee suspense date as shown on the Web.
(<http://www.udot.utah.gov/index.php/m=c/tid=303>)
2. The Preparer of the Submittal Sheet or the Standards Committee member (or authorized substitute) responsible for the submittal must be present at the Standards Committee meeting and capable of discussing and answering all questions related to the submittal. The item will be postponed to a later meeting if one of these people is not present.
3. Notify the Standards and Specifications Section immediately of any changes that impact the presentation to include absence of sponsor or delay in presentation.

Complete the following: (Use additional pages as needed.)

- A. Why? Detail the reason for changing the Standard (Specification or Drawing), what has initiated a new Standard, or what has caused a new or changed item of interest.

This drawing was previously reviewed by the Standards Committee for approval in the February 2003 Standards Meeting. The Committee discussed it, and then placed it into suspense pending the resolution of two issues: the completion of a Research study of centerline rumble strips, and the completion of a Policy addressing both centerline and shoulder rumble strips. The Policy, 06C-17, Use of Rumble Strips has been approved, and the study of the centerline rumble strips has been completed.

After review of these two documents, the drawing has had only one modification made since the one originally presented: The speed for installation has been changed from ≥ 50 mph to ≥ 45 mph. All other aspects remain the same, and are compatible with the other two rumble strip Standard Drawings, PV 6 and PV 7, and the Use of Rumble Strips Policy.

This drawing has been used in several projects as a detail drawing sheet.

- B. How is Measurement and Payment handled? Existing (from the measurement and payment document), modified, or new measurement and payment to be included with all Standard Specifications or Supplemental Specifications.

Payment can be accomplished in the normal units, either by each, lineal foot, lump sum, etc.

- C. Stakeholder Notification for AGC and ACEC:

By email provide the AGC and ACEC Standards Committee member a copy of all pertinent information relating to the specification or drawing. Detail all responses below. Indicate if no comments were received.

Note: There is a two-week response time set for this item.

Refer to the Standards Committee Web site, Members page at <http://www.udot.utah.gov/index.php/m=c/tid=659> for the respective e-mail addresses.

AGC Comments: (Use as much space as necessary.)

N/A

ACEC Comments: (Use as much space as necessary.)

N/A

- D. Stakeholders? From the list provided, document the stakeholders contacted, detailing: the company, name of contact, how contacted (by phone, email, hard copy, or in person), concerns, and comments of the change. Stakeholders:

Note: There is a two-week response time set for this item. Allow Stakeholders two weeks to process and respond to coordination requests. All areas should try to complete review and comment as soon as possible but within two weeks.

In-house (for example, preconstruction, materials, construction, safety, design, maintenance) (Include all applicable in-house areas even if not listed above.)

This drawing was reviewed with and endorsed by the Traffic Engineering Panel. Maintenance from Region One was contacted about their experience with similar style of rumble strips in a median application (Sardine Canyon) and have not expressed any concerns about the maintenance of this design. It is a similar construction technique to the one used for the installation of shoulder rumble strips used throughout the State (and referenced in STD DWGs PV-6 and PV-7). Materials has the continuing concern about any impact to the pavement surfacing by grinding away a small portion of the surface. Flush coating of the strips after milling is required to seal the surface disturbed by the grinding operation.

Construction Engineers

N/A

Contractors (Any additional contacts beyond "C" above.)

N/A

Suppliers

N/A

Consultants (as required) (Any additional contacts beyond "C" above.)

N/A

FHWA (To be accomplished as part of the two-week process before submitting to the Standards and Specifications Section for inclusion on the Standards Committee agenda.) (This is in addition to the requirements of UDOT Policy 08A5-1, procedure 08A5-1.3.)

FHWA was contacted (Roland Stanger, Utah Division)

Others (as appropriate)

N/A

- E. Other impacted areas, systems, or personnel. (Consider all impacts and possible changes to these areas during the preparation process. Coordinate with all appropriate areas for the respective item. List all impacts and action taken.)

1. Minimum Sampling and Testing Guide (MS&T Guide)

N/A

2. Business Systems (Electronic Bid System, Project Development Business System, Electronic Program Management, Computer-Aided Drafting and Design, etc.)

N/A

3. Implementation Plan (Provide detailed instructions on how the subject item will be implemented to include notification of all interested parties and training requirements.)

All new projects will use the new specification.

F. Costs? (Estimates are acceptable.)

1. Additional costs to average bid item price.

The milling operation is similar to those used on shoulder rumble strips, and there should not be any change. However, on a project that is for rumble strips only (ie, no other work requiring traffic control), there may be additional maintenance of traffic requirements relating to the centerline location. These costs will need to be evaluated on a project specific basis.

2. Operational (For example, maintenance, materials, equipment, labor, administrative, programming).

The milling operation is similar to those used on the shoulder rumble strips, and would likely use the same equipment. There may be additional maintenance of traffic requirements relating to the centerline location.

3. Life cycle cost.

No effect anticipated. The flush coating should seal the surface and allow the pavement to be rejuvenated on the normal maintenance cycle.

G. Benefits? (Provide details that can be used to complete a Cost – Benefit Analysis.) (Estimates are acceptable.) (If no costs, what is the benefit of making this change?)

The benefits for shoulder rumble strips have previously been shown to be as high as 100:1.

H. Safety Impacts?

The Safety impacts are significant. Review of other states using similar systems have indicated significant success. For example, in Delaware, a 2.9 mile stretch of US 301 experienced nine fatalities, all from head on collisions, in three years before installing centerline rumble strips. In the six years after installation, there have been NO fatalities. Traffic volumes on this section of road has increased 5% per year during this time. Although the total number of accidents in this stretch did not decrease significantly, the average yearly head on collisions decreased 90% and the number of accidents caused by motorists crossing the centerline decreased by 60%.

The Research study for UDOT (Evaluation of Four Recent Traffic and Safety Initiatives, Volume III: Centerline Rumble Strips on Rural, Two-Way, Undivided Highways) recommended the following:

Future installations of centerline rumble strips in the State of Utah should be pursued. The published literature on centerline rumble strips demonstrates a low cost method of (reducing) cross-over crashes on rural, two-way, undivided highways. Even though the current before and after crash data is less convincing when analyzed by more robust statistical analysis methods, the data still shows a reduction in cross-over crashes. Other advantages of centerline rumble strips are the low cost of installation, minimal maintenance costs, and improved lane delineation.

I. History? Address issues relating to the current usage of the item and past reviews, approvals, and/or disapprovals.

On some facilities in the State, notably US 6 from I-15 to I-70, we are experiencing serious accidents from vehicles crossing the centerline into opposing traffic. While the causes are many, including fatigue and intentional passing in a no passing zone, we believe we need the option of the centerline rumble strips as one of the tools available to us to inform the motorist of situations that require greater effort on their part to navigate the highway system.

Priority Explanation

Enter the appropriate priority in the box on the first page of the document.

- | | |
|------------|---|
| Priority 1 | Upon posting, this impacts all projects in construction and design with a Change Order, Addenda, and immediate change to projects being advertised. |
| Priority 2 | Upon posting, this impacts projects being advertised. |
| Priority 3 | Upon posting, the approved standard takes effect four weeks later for projects being advertised. |

Standard Drawing/Specification Review Sheet		Review Comments		
Std Dwg/Spec Number	PV 8, Rumble Strips, Centerline Application	Sheet 1	of	1
Date:	April 9, 2007	Facilitator:	John Leonard	

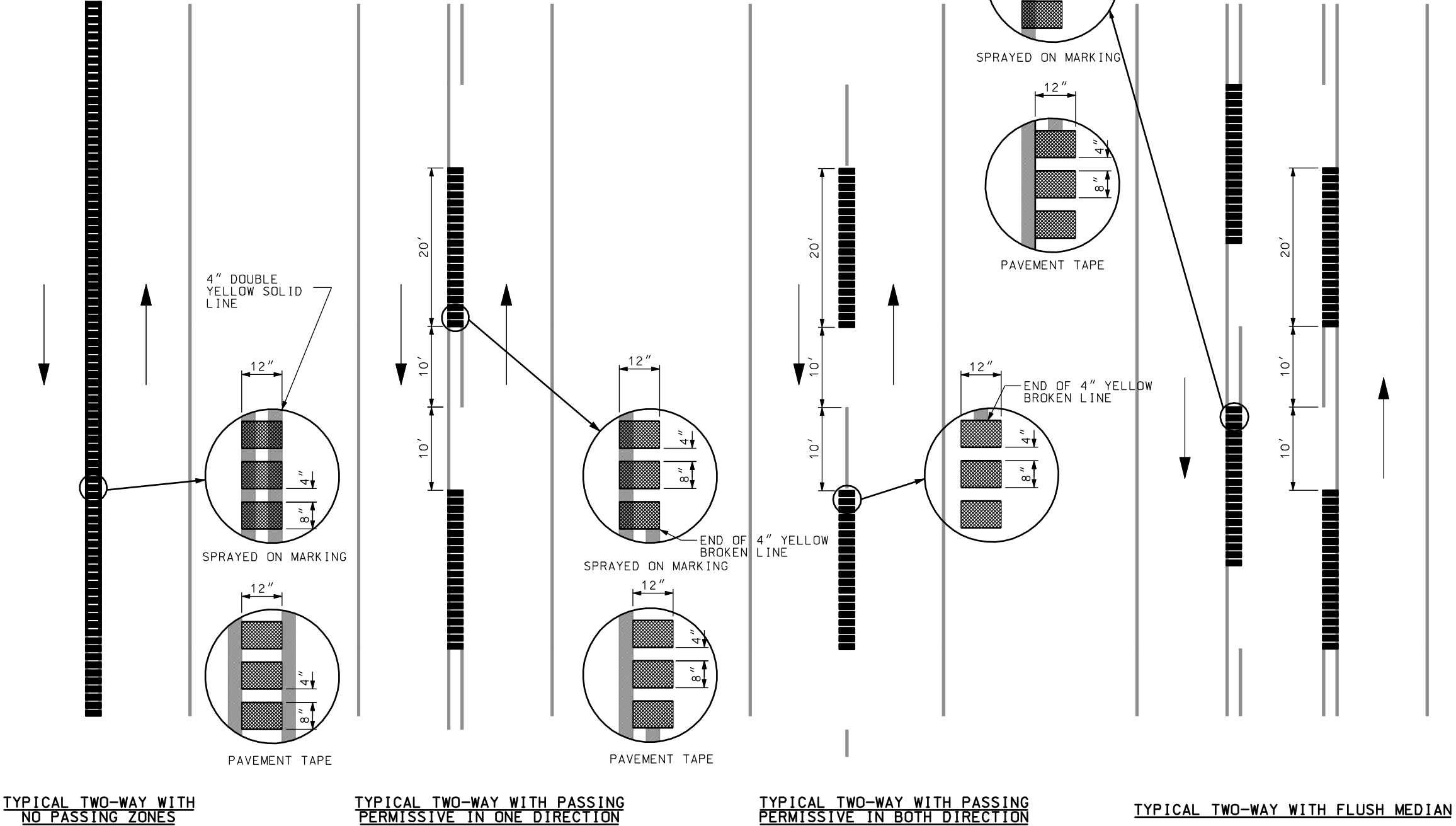
Review Comments Form

Item No.	Reviewer	Sheet/Section No.	Comment	Review Mtg. Action	Final Action.
1	Karl Verhaeren, Central Construction	PV 8	Delete Notes 1 and 2. These Notes are applicable in the Policy, not on the Standard Drawing. (Comment provided at the Feb 2007 Standards Meeting)	A	A
			Response: Information is in Policy. Notes deleted.		

Action Code	A	B	C	D
	Submitter will Comply	Submitter to Evaluate	Delete Comment	Others to Evaluate

NOTES:

- 1. REFER TO UDOT STD. DWG. PV 6 FOR RUMBLE STRIP DETAILS.
- 2. CENTER PAINT STRIPES ON RUMBLE STRIPS.
- 3. PLACE RUMBLE STRIPS ON DOWN STREAM SIDE OF BROKEN LINES WHEN PRACTICAL.
- 4. FLUSH COAT ALL RUMBLE STRIPS.



UTAH DEPARTMENT OF TRANSPORTATION STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION SALT LAKE COUNTY		REVISIONS	
		1 02/23/06	B.A. CORRECTED NOTE 1 DRAWING CALLOUT.
RUMBLE STRIPS CENTERLINE APPLICATION		DATE	
		FEB.23.2006	
STANDARD DRAWING TITLE		APPROVED	
		FEB.23.2006	
CHAIRMAN STANDARD COMMITTEE		APPR.	
		REMARKS	
DEPUTY DIRECTOR		DATE	
		FEB.23.2006	

Purpose

To define the Department's use of rumble strips on the state highway system. One of the Department's strategic goals is to improve safety. This goal can be accomplished by reducing the number and severity of single-vehicle run-off-the-road crashes while preserving safe use of the roadway by bicyclists and pedestrians. Also, using centerline rumble strips can reduce head-on crashes.

Policy

This policy applies to all highways under the jurisdiction of the Department. Placement of rumble strips will be required when the following criteria is met:

Shoulder Rumble Strips (SRS) – Divided Highways

- SRS are required on both the left and the right shoulders of all rural interstate highways.
- Consider SRS on both shoulders of other rural divided highways (non-interstate) and urban areas.

Shoulder Rumble Strips (SRS) – Undivided Highways

The use of SRS on undivided highways is based on criteria driven evaluation, of the following characteristics:

- For use on ~~on~~ rural highways with speeds of 45 mph or higher.
- Adequate pavement structure exists on the shoulder.
- Run-off-the-road crash experience is documented.
- Shoulders are wide enough to provide a minimum of four feet (~~4'~~) of shoulder between the SRS and the edge of paved shoulder. Increase the dimension to five feet (~~5'~~) if barrier or guardrail is present at the edge of the shoulder.

Centerline Rumble Strips (CRS) – Undivided Highways

The use of CRS on undivided highways is based on criteria driven evaluation of the following characteristics:

- For use on rural highways with speeds of 45 mph or higher.
- Head-on or opposite direction sideswipe crash experience exists.

Deviations from Standard~~sign exceptions~~ with regards to Rumble Strips may be granted ~~by the Engineer for Traffic and Safety under the Level 1 Elevation process~~ when:

- Another project is scheduled within two ~~(2)~~ years that will overlay or reconstruct the shoulders, or will use the shoulders as a detour.
- Pavement analysis determines that the pavement structure of the shoulder is inadequate for installation of SRS.
- Shoulders are less than four feet ~~(4')~~ wide on the left and four and one-half six feet ~~(6'4.5')~~ wide on the right.

Rumble strips are not recommended where shoulders are used by bicyclists unless there is a minimum clear path of one foot ~~(1')~~ from the rumble strip to the traveled way, four feet ~~(4')~~ from the rumble strip to the outside edge of paved shoulder, or five feet ~~(5')~~ to adjacent guardrail, curb or other obstacle.

Once installed, rumble strips will be maintained. A single chip seal may be placed over the rumble strip. However, any additional chip seals or pavement overlays will result in re-establishing rumble strips.

Standards Committee Submittal Sheet

Name of preparer: John Leonard
Title/Position of preparer: Traffic and Safety Operations Engineer
Specification/Drawing/Item Title: Traffic Control Drawings
Specification/Drawing Number: TC-1A, 1B, 1C, 1D, 2A, 2B, 3A, 3B, 3C, 3D

Enter appropriate priority level:

(See last page for explanation) 3

Sheet not required on editorial or minor changes to standards. Check with Standards Section.

NOTES:

1. All Submittal Sheets must be completed and sent to the Standards and Specifications Section by the Standards Committee suspense date as shown on the Web.
(<http://www.udot.utah.gov/index.php/m=c/tid=303>)
2. The Preparer of the Submittal Sheet or the Standards Committee member (or authorized substitute) responsible for the submittal must be present at the Standards Committee meeting and capable of discussing and answering all questions related to the submittal. The item will be postponed to a later meeting if one of these people is not present.
3. Notify the Standards and Specifications Section immediately of any changes that impact the presentation to include absence of sponsor or delay in presentation.

Complete the following: (Use additional pages as needed.)

- A. Why? Detail the reason for changing the Standard (Specification or Drawing), what has initiated a new Standard, or what has caused a new or changed item of interest.

Review of existing TC Series Drawings. Drawings have been modified as required to bring into conformance with the MUTCD, the Roadside Design Guide, and Department practice. Provided as a separate attachment is a detailed description of changes made to each sheet. After approval of these core sheets, Standard Drawings TC 4 to TC16 will be submitted for review during the next Standards Committee Cycle.

- B. How is Measurement and Payment handled? Existing (from the measurement and payment document), modified, or new measurement and payment to be included with all Standard Specifications or Supplemental Specifications.

Existing

C. Stakeholder Notification for AGC and ACEC:

By email provide the AGC and ACEC Standards Committee member a copy of all pertinent information relating to the specification or drawing. Detail all responses below. Indicate if no comments were received.

Note: There is a two-week response time set for this item.

Refer to the Standards Committee Web site, Members page at <http://www.udot.utah.gov/index.php/m=c/tid=659> for the respective e-mail addresses.

AGC Comments: (Use as much space as necessary.)

No Comments
Attached in Comment Resolution document.

ACEC Comments: (Use as much space as necessary.)

No Comments
Attached in Comment Resolution document.

D. Stakeholders? From the list provided, document the stakeholders contacted, detailing: the company, name of contact, how contacted (by phone, email, hard copy, or in person), concerns, and comments of the change. Stakeholders:

Note: There is a two-week response time set for this item. Allow Stakeholders two weeks to process and respond to coordination requests. All areas should try to complete review and comment as soon as possible but within two weeks.

List of all individuals attached.

In-house (for example, preconstruction, materials, construction, safety, design, maintenance) (Include all applicable in-house areas even if not listed above.)

All Project Managers, all Preconstruction Engineers, all Traffic Engineers, all Risk Management, all Maintenance Engineers, all Area Supervisors, all Permits officers, all Region and District Directors, and all members of the Standards Committee.

Construction Engineers

All Construction Engineers, Central Construction, and REs

Contractors (Any additional contacts beyond "C" above.)

None

Suppliers

None

Consultants (as required) (Any additional contacts beyond "C" above.)

None

FHWA (To be accomplished as part of the two-week process before submitting to the Standards and Specifications Section for inclusion on the Standards Committee agenda.) (This is in addition to the requirements of UDOT Policy 08A5-1, procedure 08A5-1.3.)

Anthony Sarahan. Roland Stanger has been a partner throughout the review process.

Others (as appropriate)

None

- E. Other impacted areas, systems, or personnel. (Consider all impacts and possible changes to these areas during the preparation process. Coordinate with all appropriate areas for the respective item. List all impacts and action taken.)

1. Minimum Sampling and Testing Guide (MS&T Guide)

None

2. Business Systems (Electronic Bid System, Project Development Business System, Electronic Program Management, Computer-Aided Drafting and Design, etc.)

None

3. Implementation Plan (Provide detailed instructions on how the subject item will be implemented to include notification of all interested parties and training requirements.)

None

- F. Costs? (Estimates are acceptable.)

1. Additional costs to average bid item price.

None

2. Operational (For example, maintenance, materials, equipment, labor, administrative, programming).

None

3. Life cycle cost.

None

- G. Benefits? (Provide details that can be used to complete a Cost – Benefit Analysis.) (Estimates are acceptable.) (If no costs, what is the benefit of making this change?)

Compliance with the MUTCD and safer operating practices.

- H. Safety Impacts?

Compliance with the MUTCD and safer operating practices.

- I. History? Address issues relating to the current usage of the item and past reviews, approvals, and/or disapprovals.

Integral part of all projects, maintenance operations, and permitted operations.

Priority Explanation

Enter the appropriate priority in the box on the first page of the document.

- Priority 1 Upon posting, this impacts all projects in construction and design with a Change Order, Addenda, and immediate change to projects being advertised.
- Priority 2 Upon posting, this impacts projects being advertised.
- Priority 3 Upon posting, the approved standard takes effect **four weeks** later for projects being advertised.

Standard Drawing/Specification Review Sheet		Review Comments		
STD DWG/Spec Number	TC 1 to TC 3D	Sheet 1	of	10
Date:	April 2007	Facilitator:	John Leonard	

Review Comments Form

Item No.	Reviewer	Sheet/Section No.	Comment	Review Mtg. Action	Final Action.
1	Todd Richins, R-2 Maint.	TC-1A	I really do not have anything to comment on your proposed revisions. I do support the direction you are going with these changes, especially Standard Drawing TC 1A "Reflective banding on traffic cones and allowing 3 days and 2 nights".	A	A
			Response:		
2	Todd Richins, R-2 Maint.	TC-1B	I also support Standard Drawing TC 1B "Reflective edging on 2 flags for portable signing". I feel these are improvements that are needed, and will increase safety out in the field.	A	A
			Response:		
3	Bill Lawrence, R-2 Preconst	General	Looks good.	A	A
			Response:		
4	Barry Axelrod, Eng. Serv.	All	None of the drawings have signatures X'd out on them	A	A
			Response: Drawing modified with correct border		
5	Clark Mackay, R-4	TC 1A, Note 5	I did not understand what the reference to long cones means near the end of the note. I recommend eliminating 'to be detectable to users of long cones'	C	C
			Response: Spelling error. Reference is to 'Long Canes', an ADA requirement. Spelling corrected.		
6	Clark Mackay, R-4	TC 2B, Note 11	Eliminate 'see policy 06C-61'. The standard drawings are for contractor use. UDOT policies are for UDOT employees and not the contractor. The contractor does not appear to have access to UDOT policy and procedures. We should not refer our contractors to UDOT policies.	B	D
			Response: Standard Drawings are also used by UDOT employees, including construction, maintenance, design, traffic & safety, and permits. This reference allows better understanding of the process for reduced speeds in work zones		
7	Clark Mackay, R-4	General	Many of the notes use the word 'shall'. It is my understanding that we are supposed to be using imperative form and not shall.	A	A
			Response: Notes modified as necessary to provide active voice		

Action Code	A	B	C	D
	Submitter will Comply	Submitter to Evaluate	Delete Comment	Others to Evaluate

Standard Drawing/Specification Review Sheet		Review Comments		
STD DWG/Spec Number	TC 1 to TC 3D	Sheet 2	of	10
Date:	April 2007	Facilitator:	John Leonard	

Item No.	Reviewer	Sheet/Section No.	Comment	Review Mtg. Action	Final Action.
8	Rob Wight, R-2 Const	TC 1A	I don't see any restrictions as to whether cones can be used at night on high speed facilities. I have concerns with cones being used during nighttime operations on high speed facilities, especially on urban interstates. We have had situations during nighttime closures that people are crossing into workzones where we have barrels, and using something with less reflective surface area would only make that situation worse in my mind. I do see that they can only be used for 2 nights, but in say a grinding operation, they are removed each night anyway. I would be opposed to allowing this.	B	C
			Response: Added and edited notes to clarify that cones are to be used at night only when there are workers present. The intent is that they will not be unattended at any time. If the operation does go for the maximum of 3 days/2night, the operation must be continuous so that there are always workers on site. Restricted the use to roads with speeds of 50 mph or less and roads that are not freeways or divided highways. Exempted pavement marking operations from these restrictions.		
9	Doug Bassett, R-3 T&S	General	No comments. The new and revised sheets should make things a lot clearer for everyone. Good job.	A	A
			Response:		
10	Mike Seng, R-4 RE	General	No comments.	A	A
			Response:		
11	Mike Miles, R-4 PreConst	General	I have no comments.	A	A
			Response:		
12	Hugh Kirkham, R- Price Dist. Eng	TC 1A	The only issue I have, and this is from experience. Allowing cones to be used at night, especially with a time limit, will become a legal and control issue in case of accident or for project personnel. The documentation to prove how many days and or nights will become a burden. We have worked for years to ensure the use of drums or vertical panels at night and we should continue to keep this requirement!	B	A

Action Code	A	B	C	D
	Submitter will Comply	Submitter to Evaluate	Delete Comment	Others to Evaluate

Standard Drawing/Specification Review Sheet		Review Comments		
STD DWG/Spec Number	TC 1 to TC 3D	Sheet 3	of	10
Date:	April 2007	Facilitator:	John Leonard	

Item No.	Reviewer	Sheet/Section No.	Comment	Review Mtg. Action	Final Action.
			Response: Added and edited notes to clarify that cones are to be used at night only when there are workers present. The intent is that they will not be unattended at any time. If the operation does go for the maximum of 3 days/2night, the operation must be continuous so that there are always workers on site. Restricted the use to roads with speeds of 50 mph or less and roads that are not freeways or divided highways. Exempted pavement marking operations from these restrictions.		
13	Rob Clayton, TOC	General	Looks good John.	A	A
			Response:		
14	Anne Ogden, R-4 Traffic	TC 1A	--In note 4, "daytime" should be one word. Also, what about the practice of using tubular markers as delineation along the edge of the roadway. Can they be used for this application, but not channelizing devices, at nighttime? Or is that not allowed?	A B	A C
			Response: Editorial change made. Tubular markers can be used for daytime channelizing only		
15	Anne Ogden, R-4 Traffic	TC 1B	--MUTCD uses the term "orange-red" (w/ hyphen 6E.02) instead of "red orange" (w/o hyphen) --Should it be consistently "retroreflective edging" OR "retroreflective sheeting" (one or the other, but not some of each)?	A A	A A
			Response: Editorial changes made.		
16	Anne Ogden, R-4 Traffic	TC 1C	--Should note 3 specify that "sequential chevron" may be used, too? Or is it just a "sequential arrow" that may be used? --Hyphenate "federal-funded" and "state-funded"	B A	C C
			Response: Chevron Arrow is the one shown in the detail. Sequential Arrow is an option only. Editorial Change made.		
17	Anne Ogden, R-4 Traffic	TC 1D	Note 4. Is painting the bracket required? Why?	B	C
			Response: Painting of the bracket is required to protect the bracket. Note 4 was modified to allow the use of galvanizing as well.		

Action Code	A	B	C	D
	Submitter will Comply	Submitter to Evaluate	Delete Comment	Others to Evaluate

Standard Drawing/Specification Review Sheet		Review Comments		
STD DWG/Spec Number	TC 1 to TC 3D	Sheet 4	of	10
Date:	April 2007	Facilitator:	John Leonard	

Item No.	Reviewer	Sheet/Section No.	Comment	Review Mtg. Action	Final Action.
18	Anne Ogden, R-4 Traffic	TC 2A	--Line "1" in Detail TC 2A-1 - Maybe reword to say "Use detail TC 2A-1 and Table 1 (Work Clear Zone) when mitigating..."	A	A
			--Line 1.D in Detail TC 2A-1 - Use "I.E." instead of "IE:"	A	A
			--"Article 1.6F" and "Article 3.1D" are actually "paragraphs" - Maybe show as "Paragraph 1.6.F" and "Paragraph 3.1.D"	B	C
			--Reorganize text in upper left box ("Remove from work site or relocate outside...") for aesthetics?	A	A
			--Detail TC 2A-2 - Details are slightly confusing...maybe because it's attempting to combine slopes and vertical faces. It's misleading to have the note "Steeper than 4:1" near two lines with different slopes. Where is the 18"-32" or 6"-48" height measured? At the edge of the travel lane for vertical faces? How far from the travel lane for slopes steeper than 4:1?	B	A
			Response: Editorial changes made. Current practice is to call out Specification reference only, not the specific Article or Paragraph. Reference modified. Drawing was modified for clarity		
19	Anne Ogden, R-4 Traffic	TC 2B	--Note 9 - For consistency, should it be "Travel Lane" instead of "Traffic Lane"?	A	A
			--Note 11 - Specify that the regulatory speed limit to be restored is the original posted speed limit?	A	A
			--Note 18 - Hyphenate "high-speed"	A	A
			Response: Editorial changes made.		
20	Anne Ogden, R-4 Traffic	TC 3A	--"Advance warning arrow panel" symbols don't match each other	A	A
			--Why show B/O, B/W, & B/W sign colors on the speed limit sign when note 6 says "See Std Deg TC 3D for sign design and layout"?	A	A
			--Note 3 - Specify "Advance warning arrow panel"?	A	A
			--Note 4 - "Use" instead of "Used"	A	A
			--Note 5 - Hyphenate "high-speed"	A	A
			Response: Symbol changed to match key. Editorial changes made		

Action Code	A	B	C	D
	Submitter will Comply	Submitter to Evaluate	Delete Comment	Others to Evaluate

Standard Drawing/Specification Review Sheet			Review Comments		
STD DWG/Spec Number	TC 1 to TC 3D		Sheet 5	of	10
Date:	April 2007		Facilitator:	John Leonard	

Item No.	Reviewer	Sheet/Section No.	Comment	Review Mtg. Action	Final Action.
21	Anne Ogden, R-4 Traffic	TC 3B	--"Advance warning arrow panel" symbols don't match each other	A	A
			--Is it understood that W3-5 and W3-5a are interchangeable? Should both be shown? Or do we have a preference as a state for W3-5?	A	A
			--Why show B/O, B/W, & B/W sign colors on the speed limit sign when note 6 says "See Std Deg TC 3D for sign design and layout"?	A	A
			--Specify "Reduced Speed", since "Posted Speed" is specified?	A	A
			--Note 2 - Cover <i>all</i> speed limit signs or just the reduced speed ones? Also, align with other notes and change "not" to "no".	A	A
			--Note 3 - Specify "Advance warning arrow panel"?	A	A
			--Note 6 - Hyphenate "high-speed"	A	A
			Response: Symbol changed to match key. Note added to detail allowing the option of the W3-5a sign. Editorial changes made		
22	Anne Ogden, R-4 Traffic	TC-3C	--Hyphenate "Multi-lane"? --"Divided Roadways in Urbanized Areas" --Reword Note 4 to match word content and order on sign.	A B A	A C A
			Response: Editorial changes made. 'Urbanized' deleted from detail title		
23	Anne Ogden, R-4 Traffic	TC 3D	--Colors are listed for every sign except Stop/Slow paddle. Do they need to be shown? --Note 5 - "...unless use of portable sign supports <i>receives</i> approval..."	A A	A A
			Response: Colors shown Editorial change made		
24	Troy Peterson, R-2 Traffic	General	No Comments.	A	A
			Response:		
25	Robert Markle, R-3 Traffic	General	No Comments.	A	A
			Response:		

Action Code	A	B	C	D
	Submitter will Comply	Submitter to Evaluate	Delete Comment	Others to Evaluate

Standard Drawing/Specification Review Sheet		Review Comments		
STD DWG/Spec Number	TC 1 to TC 3D	Sheet 6	of	10
Date:	April 2007	Facilitator:	John Leonard	

Item No.	Reviewer	Sheet/Section No.	Comment	Review Mtg. Action	Final Action.
26	Lyndon Friant, R-4 RE	TC 1A	The only concern that I might have is if cones are used, come morning when we show up to work, they are going to be blown all over. Barrels have a hard time staying in place, but like the barrels, we have had to use double rings so they would stay put. Thanks for cleaning and clarifying the hazard mitigation chart. It looks good.	B	A
			Response: Added and edited notes to clarify that cones are to be used at night only when there are workers present. The intent is that they will not be unattended at any time. If the operation does go for the maximum of 3 days/2night, the operation must be continuous so that there are always workers on site. Restricted the use to roads with speeds of 50 mph or less and roads that are not freeways or divided highways. Exempted pavement marking operations from these restrictions.		
27	Tyler Yorgason, ACEC	General	None of the revised sheets have revisions noted in the revision blocks. Actually there are a lot of things changed, not sure what would be best to put in revision blocks, maybe just put in "multiple revisions" or something similar where there isn't room for comprehensive comments.	B	C
			Response: These are 'new' drawings for the 2008 publication, and do not have revisions listed in the title block		
28	Tyler Yorgason, ACEC	TC 1A	Note 5, last sentence - Don't need the comma after "devices"; what does it mean that drums, cones or markers need to be 36" to be "detectable to users of long cones"?	A A	A A
			Response: Comma removed. Spelling error—should be 'CANES' for ADA compliance		
29	Tyler Yorgason, ACEC	TC 1A	Note 8 - It doesn't appear that the "more than 36 inch" cone (drawn on the right side) meets all the requirements of the note (minimum 2 orange and 2 white stripes, retroreflective stripes 4-6 inches wide, spaces between orange and white not exceeding 3 inches).	A	A
			Response: Drawing was revised to be more clear		
30	Tyler Yorgason, ACEC	TC 1B	Note 4 (Also TC 3D, Note 6)- Where are Post Types P1 or P3 defined? We couldn't find them in the SN series of Std. Dwgs.	B	C

Action Code	A	B	C	D
	Submitter will Comply	Submitter to Evaluate	Delete Comment	Others to Evaluate

Standard Drawing/Specification Review Sheet		Review Comments		
STD DWG/Spec Number	TC 1 to TC 3D	Sheet 7	of	10
Date:	April 2007	Facilitator:	John Leonard	

Item No.	Reviewer	Sheet/Section No.	Comment	Review Mtg. Action	Final Action.
			Response: Post types are listed in SN 8 (P1) and SN 10 (P3)		
31	Tyler Yorgason, ACEC	TC 2A	2nd note next to "Slope Steeper than 4:1 ..." illustration - How far outside Work Clear Zone will devices need to be used? When devices are used, does it mean to use standard channelizing devices as noted in the Hazard Mitigation flow chart?	B	C
			Response: The hazard mitigation chart is for all items within the AASHTO Clear Zone. The chart details how to address these hazards. Therefore, any need between the Work Clear Zone and the AASHTO Clear Zone would be mitigated as per the flow chart.		
32	Tyler Yorgason, ACEC	TC 2A, 2B	Do you want a note on 2A referring to notes on 2B? Can the title on 2B be changed to "Hazard Mitigation Notes" or something (to tie it into 2A)?	B	A
			Response: The notes on TC 2B are general in nature, applying to the entire TC Series. Title of TC 2B changed to "General" Notes.		
33	Tyler Yorgason, ACEC	TC 3A, 3B	Just a thought - rather than having it duplicated on both sheets, consider placing the information that is the same (top half of both sheets and most of the notes) on one sheet and then put the standard and the reduced speed work zone signing details, and any appropriate notes, on the second sheet. On the other hand, it may be more practical to have complete information on sheets related to both standard and reduced speed work zones as you currently have it.	B B	C A
			Response: Left as is,		
34	Tyler Yorgason, ACEC	TC 3B	Note 2 - Does this mean reduced speed limit is intended to apply only when work is being performed? Is the normal (unreduced) speed intended to apply when taper and lane closure are in place but no work is being performed at the moment? How long (or short) of a period of no work being performed triggers removing or covering speed limit reduction signs?	B B	C A

Action Code	A	B	C	D
	Submitter will Comply	Submitter to Evaluate	Delete Comment	Others to Evaluate

Standard Drawing/Specification Review Sheet			Review Comments		
STD DWG/Spec Number	TC 1 to TC 3D		Sheet 8	of	10
Date:	April 2007		Facilitator:	John Leonard	

Item No.	Reviewer	Sheet/Section No.	Comment	Review Mtg. Action	Final Action.
			Response: The reduced speed is only to apply when workers are present. When no work is occurring, then the speed limit would revert back to the speed prior to work. This period should happen whenever work is stopped. Note 2 was modified to allow the reduced speed limit to remain in place as approved by the Region Traffic Engineer		
35	Tyler Yorgason, ACEC	General	Overall, the changes appear to be very helpful and are appreciated. Thanks for the chance for ACEC to comment on them.	A	A
			Response:		
36	Troy Torgerson, R-4 Traffic	TC 1A	Tall Cone Detail—Remove ‘36” Min ≥ 45 MPH’ Tall Cone Detail—Add 5 to Notes call out Tubular Marker Detail—Add ‘See Note 5’ Note 5—‘Cones’ is ‘Canes’ Note 7—End of second line, add ‘IN’ Note 7—Third line, remove extra space Note 8—Fifth Line, remove space Note 8—Fifth Line, add ‘THE’ after ‘With’ Note 8—Fifth Line, add hyphen after ‘NON’ Vertical Panel Detail—Fill in base Vertical Panel Detail—Add ‘MAX’ to 12” dimension	A A A A A A A A A A A	A A A A A A A A A A A
			Response: Editorial changes made.		
37	Troy Torgerson, R-4 Traffic	TC 1B	Note 4—Remove ‘ES’ from ‘INCHES’	A	A
			Response: Editorial changes made.		
38	Troy Torgerson, R-4 Traffic	TC 1D	Note 5—Add ‘S’ to ‘SCREW’ Do you want to show a minimum delineator post length of 84" like our Std. Dwg. indicates?	A B	A C
			Response: Editorial change made. Standard Drawing GW 9 covers the delineator height.		
39	Troy Torgerson, R-4 Traffic	TC 2A	Use proper call out for references to Standard Specifications—Article 3.1, Paragraph D	B	C
			Response: Current practice is to call out Specification reference only, not the specific Article or Paragraph. Reference modified.		
40	Troy Torgerson, R-4 Traffic	TC 2B	Note 8-- Use proper call out for references to Standard Specifications—Article 3.1, Paragraph D Note 11—Last line, change the ‘06’ to ‘06’ Note 15—Last line, add ‘S’ to ‘HOUR’	B A A	C A A

Action Code	A	B	C	D
	Submitter will Comply	Submitter to Evaluate	Delete Comment	Others to Evaluate

Standard Drawing/Specification Review Sheet			Review Comments		
STD DWG/Spec Number	TC 1 to TC 3D		Sheet 9	of	10
Date:	April 2007		Facilitator:	John Leonard	

Item No.	Reviewer	Sheet/Section No.	Comment	Review Mtg. Action	Final Action.
			Response: Current practice is to call out Specification reference only, not the specific Article or Paragraph. Reference modified. Editorial changes made.		
41	Troy Torgerson, R-4 Traffic	TC 3A	In 1—Taper Length Formulas, match style of ½ and 1/3	B	B
			In 2—Channelizing Devices, remove ‘CLOSURE’ in use with ‘SHOULDER’	A	A
			In 2—Channelizing Devices, ‘DOWN STREAM’ is one word	A	A
			In 2—Channelizing Devices, hyphenate ‘ONE LANE’ and ‘TWO WAY’	A	A
			In the Traffic Control Device Legend key, the reference for channelizing device is TC 1A	A	A
			Response: Having difficulty matching styles for fractions. Will word on settings Editorial changes made.		
42	Troy Torgerson, R-4 Traffic	TC 3B	In 1—Taper Length Formulas, match style of ½ and 1/3	B	B
			In 2—Channelizing Devices, remove ‘CLOSURE’ in use with ‘SHOULDER’	A	A
			In 2—Channelizing Devices, ‘DOWN STREAM’ is one word	A	A
			In 2—Channelizing Devices, hyphenate ‘ONE LANE’ and ‘TWO WAY’	A	A
			In the Traffic Control Device Legend key, the reference for channelizing device is TC 1A	A	A
			Note 2—Align with other notes	A	A
			Note 2—Add ‘REDUCED’ in front of ‘SPEED’	A	A
			Note 2—Remove ‘T’ from ‘NOT’	A	A
			Response: Having difficulty matching styles for fractions. Will word on settings Editorial changes made.		
43	Troy Torgerson, R-4 Traffic	TC 3C	Remove ‘IN URBANIZED’ from Detail TC 3C-3	A	A
			Response: Editorial change made.		
44	Troy Torgerson, R-4 Traffic	TC 3D	Flagger Stop/Slow Paddle Detail—Remove extra space in title	A	A
			Response: Editorial change made.		
45	Glen Schulte, T&S	TC 1A	Change notes to Active Voice	A	A
			Response: Editorial changes made.		

Action Code	A	B	C	D
	Submitter will Comply	Submitter to Evaluate	Delete Comment	Others to Evaluate

Standard Drawing/Specification Review Sheet		Review Comments		
STD DWG/Spec Number	TC 1 to TC 3D	Sheet 10	of	10
Date:	April 2007	Facilitator:	John Leonard	

Item No.	Reviewer	Sheet/Section No.	Comment	Review Mtg. Action	Final Action.
46	Glen Schulte, T&S	TC 1B	Change notes to Active Voice Add note requiring portable sign stands to be NCHRP-350 compliant Note 5—require type of sheeting	A B B	A C C
			Response: Editorial changes made. Compliance is required in Specification 01554 Sheeting requirements are in Specification 02891		
47	Glen Schulte, T&S	TC 1D	Welded Connection Detail—Add call out arrow to bottom weld	A	A
			Response: Arrow added		
48	Glen Schulte, T&S	TC 3A	Note 4—Remove ‘D’ from ‘USED’ Add note about use of ‘Fines Doubled’ sign at intersections	A A	A A
			Response: Editorial change made. Note added		
49	Glen Schulte, T&S	TC 3B	Add note about use of ‘Fines Doubled’ and reduced speed limit signs at intersections	A	A
			Response: Note added		
50	Glen Schulte, T&S	TC 3C	Change Note 5 to Active Voice	A	A
			Response: Editorial change made.		
51	Mont Wilson, AGC	General	Called when no written response. Mont returned call and indicated that he saw no issues that would affect the AGC members at this time.	A	A
			Response:		
52	FHWA	TC 3C	Need to address the issue of traffic queuing up and being outside of the advance warning signs	A	A
			Response: Added note that reinforces adding additional signs as vehicle queue exceeds the advance warning signs.		

Action Code	A	B	C	D
	Submitter will Comply	Submitter to Evaluate	Delete Comment	Others to Evaluate

TC 1A:

1. Updated barricades to match the MUTCD.
2. Added direction indicator barricade to be used in work zones.
3. Updated cones to match the MUTCD, added retroreflective banding, and approved cones to be used up to three days and two nights.
4. Moved Arrow panels to new standard drawing TC 1C.
5. Revised notes 3-9. Moved old note 3 to TC 1C
6. Removed support legs from barricades
7. Changed title of standard drawing TC 1 A from Construction zone channelization devices to Work Zone channelization devices.

TC 1B:

1. Updated type III barricades to match barricades in the MUTCD.
2. Move signs, flagger stop / slow paddle to TC 3D
3. Changed number and type of flags on portable supports from 3 unreflective flags to 2 flags with retroreflective edging.
4. Added retroreflective flag edging detail.
5. Changed note 5.
6. Changed note 7.
7. Added note 8.
8. Removed support legs from barricades
9. Reinforced MUTCD requirements of limiting the use of signs on portable stands to 7 days or less
10. Changed title of standard drawing from construction zone signing to work zone signing.

TC 1C: NEW DRAWING

1. Moved Arrow Panels to this drawing from TC 1A.
2. Changed wording to be consistent with MUTCD.
3. Added notes 1-6.
4. Added titles Chevron arrow, Flashing double arrow and Flashing caution.
5. Title of standard drawing Work zone advanced warning arrow panels.

TC 1D: New Drawing for delineator post-mounted sign bracket

1. Title Delineator mounted work zone sign bracket.
2. Has been NCHRP 350 crash tested.

TC 2A:

1. Modified Hazard Mitigation Chart to reflect current Department Specifications, current AASHTO Roadway Design Guide, and the current MUTCD.
2. Primary modifications to the flow of Hazard "E".
3. Added to bottom of Detail TC-1 drop off definition.
4. Added reference to Specification 01558 3.1d for marking vertical drop off.
5. Moved notes to new standard drawing TC 2B.
6. Added type E vertical drop off hazards detail TC 2A-2
7. Title Hazard Mitigation.

TC 2B New Drawing:

1. Moved all notes from standard drawing TC 2A
2. Added new notes 2, 4, 17, 18
3. Modified notes 1, 3, 11, 14
4. Minor editorial comments to other notes
5. Title Notes.

TC 3A:

1. Old standard drawing TC 2B was moved into the TC-3 set, and broken up into two new drawings TC 3A and TC 3B.
 - a. TC-3A is without a reduced speed in the work zone
 - b. TC-3B is with a reduced speed in the work zone
2. Added road type conventional and freeway/expressway to chart.
3. Changed Buffer Zone to match the MUTCD.
4. Changed Notes in Channelizing Devices to better define the requirements for merging tapes and shoulder tapers.
5. Changed note see STD DWG TC 3 for project limit signing (Old Std Dwg TC-3).
6. Moved sign icons out of road.
7. Added three missing traffic control signs.
8. Added arrow panel to drawing.
9. Added optional work zone speed limit fines double sign.
10. Added notes 1-6.

TC 3B:

1. Added road type conventional and freeway/ expressway to chart.
2. Changed Buffer Zone to match the MUTCD.
3. Changed Notes in Channelizing Devices to better define the requirements for merging tapes and shoulder tapers..
4. Changed note see STD DWG TC 3 for project limit signing (Old Std Dwg TC-3).
5. Moved sign icons out of road.
6. Changed from five signs to seven.
7. Added arrow panel to drawing.
8. Added optional work zone speed limit fines double sign.
9. Added notes 1-7.

TC 3C:

1. Originally TC-3
2. Fines double signs are moved to TC-3A and TC-3B except in advance on a side street.
3. Cleaned up layout.
4. Modified notes 3,4,5,6,7 and 8.

TC 3D: New drawing

1. Placed all specialty signs on this drawing

Mail Envelope Properties (4601CDD8.D66 : 156 : 5649)

Subject: Proposed Revisions to Standard Drawings TC 1 through TC 3D
Creation Date Wednesday, March 21, 2007 6:29 PM
From: JOHN LEONARD

Created By: JLEONARD@utah.gov

Recipients	Action	Date & Time
SRCOPO1.SRDOMAIN	Delivered	03/21/07 6:29 PM
JSCEILI (Justin Sceili)	Opened	03/22/07 3:30 PM
	Emptied	03/26/07 12:21 PM
LYNNBERNHARD CC (Lynn Bernhard)	Opened	03/26/07 1:20 PM
RHULL (Robert Hull)	Opened	03/21/07 9:48 PM
RICHARDCLARKE (Richard Clarke)	Opened	03/23/07 8:30 AM
civilscience.com	Transferred	03/21/07 6:31 PM
tyorgason (Tyler Yorgason)		
dot.gov	Transferred	03/21/07 6:32 PM
anthony.sarhan (Anthony Sarhan)		
Roland.Stanger CC (Roland Stanger)		
gcinc.com	Transferred	03/21/07 6:32 PM
mont.wilson (Mont Wilson)		
utah.gov		
SRCOPO1.SRDOMAIN	Delivered	03/21/07 6:29 PM
BAXELROD CC (Barry Axelrod)	Opened	03/22/07 6:26 AM
	Replied	03/22/07 6:38 AM
BWHEELER (Boyd Wheeler)	Opened	03/22/07 5:45 PM
DGIANNONATTI CC (Darrell Giannonatti)	Deleted	04/05/07 9:49 AM
	Emptied	04/05/07 9:54 AM
GOVARD CC (Garr Ovard)	Opened	03/22/07 10:59 AM
GSCHULTE (Glenn Schulte)	Opened	03/22/07 6:38 AM
JLEONARD (JOHN LEONARD)	Opened	03/22/07 9:14 AM
LMONTOYA (Larry Montoya)	Opened	03/22/07 10:24 AM
MDONIVAN (Mike Donovan)	Opened	03/22/07 7:14 AM
	Forwarded	03/22/07 7:16 AM
	Forwarded	03/22/07 7:26 AM
PNEGUS CC (Peter Negus)		
RLINDSEY (Rukhsana Lindsey)	Downloaded	03/30/07 3:10 PM
ROBERTMILES CC (Robert Miles)	Opened	03/22/07 12:10 PM
	Deleted	04/02/07 9:44 AM
	Emptied	04/10/07 1:15 AM

SBURNS (Stan Burns)	Opened	03/22/07 7:55 AM
	Forwarded	03/26/07 7:51 AM
	Deleted	03/26/07 7:51 AM
STANADAMS CC (Stan Adams)	Opened	03/22/07 2:52 PM
TBIEL (Tim Biel)	Opened	03/22/07 9:43 AM
WGRAMES CC (Warren Grames)	Downloaded	03/26/07 4:29 PM
WSJONES (W. Scott Jones)	Opened	03/21/07 9:33 PM
	Deleted	03/23/07 4:15 PM
	Emptied	03/30/07 1:21 AM
utah.gov		
SRR1PO1.SRDOMAIN	Delivered	03/21/07 6:30 PM
BHUMPHREYS (Humphreys, Brad)	Opened	03/22/07 5:04 AM
BILLGOOCH (Gooch, Bill)		
BILLSMITH (Bill Smith)	Opened	03/22/07 6:16 AM
	Deleted	03/26/07 3:31 PM
	Emptied	04/02/07 6:44 AM
CJACOBSON (Carrie Jacobson)	Opened	03/22/07 9:06 AM
CMACE (Mace, Charles)	Opened	03/22/07 1:19 PM
CORYPOPE CC (Cory Pope)	Opened	03/21/07 6:39 PM
	Deleted	03/21/07 7:24 PM
	Emptied	03/29/07 1:05 AM
DDUERSCH (Darin Duersch)	Opened	03/27/07 8:45 AM
DEADAMSON (Adamson, David)	Opened	03/22/07 11:33 AM
DENNISSIMPER (Dennis Simper)	Opened	03/22/07 8:44 AM
DFRISTRUP (Fristrup, Darin)	Opened	03/22/07 8:54 AM
GLENAMES (Glen Ames)	Opened	03/22/07 9:47 PM
	Deleted	03/23/07 12:00 AM
	Emptied	04/01/07 9:37 PM
KBARRETT (Kelly Barrett)	Opened	03/22/07 9:07 AM
KBLADEN (Keith Bladen)	Opened	03/22/07 5:56 AM
KGRIFFIN (Kevin Griffin)	Opened	03/26/07 2:40 PM
MCRASMUSSEN (Rasmussen, Marjorie)	Opened	03/22/07 7:30 AM
NATEPETERSON (Nathan Peterson)	Opened	03/22/07 8:50 AM
	Forwarded	03/22/07 8:52 AM
NLEE (Nathan Lee)	Opened	03/22/07 7:07 AM
	Deleted	03/23/07 7:54 AM
	Emptied	03/29/07 8:38 AM
NPETERSON (Nick Peterson)	Opened	03/22/07 8:17 AM
NTHURGOOD (Norton Thurgood)	Emptied	03/21/07 9:49 PM
REXHARRIS (Rex Harris)	Replied	03/21/07 6:30 PM
SNIEBERGALL (Steven Niebergall)	Opened	03/22/07 9:21 AM
	Deleted	03/26/07 11:54 AM
	Emptied	04/10/07 1:09 AM
SNUSSBAUM (Scott Nussbaum)	Opened	03/22/07 6:18 AM
	Deleted	03/22/07 2:11 PM

	Emptied	03/27/07 12:34 PM
TOMMYVIGIL (Tommy Vigil)	Opened	03/21/07 7:54 PM
VSTOKER (Val Stoker)	Opened	03/22/07 5:36 AM
	Deleted	03/24/07 2:26 PM
	Emptied	04/08/07 1:07 AM
utah.gov		
SRR2PO1.SRDOMAIN	Delivered	03/21/07 6:29 PM
BILLLAWRENCE (Bill Lawrence)	Opened	03/22/07 6:33 AM
	Forwarded	03/26/07 2:49 PM
	Replied	03/27/07 7:02 AM
	Deleted	03/27/07 7:02 AM
BPURDIE (Betty Purdie)	Opened	03/22/07 11:45 AM
CKERGAYE (Kergaye, Cameron)	Opened	03/22/07 8:35 AM
	Deleted	04/02/07 9:34 AM
DANIELYOUNG (Daniel Young)	Opened	03/22/07 8:52 AM
	Emptied	03/22/07 8:54 AM
DAVEMILLER (Dave Miller)	Opened	03/22/07 7:10 AM
	Deleted	03/22/07 7:11 AM
	Emptied	03/30/07 1:04 AM
DLINFORD (Dallas Linford)	Opened	03/22/07 8:50 AM
	Forwarded	03/22/07 8:52 AM
DROSENSTEIN (Darren Rosenstein)	Opened	03/22/07 8:52 AM
DWEESE (Dottie Weese)	Opened	03/22/07 6:27 AM
JASONDAVIS CC (Jason Davis)	Opened	03/22/07 6:13 AM
	Deleted	03/30/07 2:19 PM
	Emptied	03/30/07 2:20 PM
JKAMMERER (Joe Kammerer)	Opened	03/22/07 10:55 AM
	Deleted	03/22/07 10:55 AM
	Emptied	03/30/07 1:05 AM
JMMASON (Jack Mason)	Opened	03/22/07 7:05 AM
	Deleted	04/02/07 8:47 AM
	Emptied	04/10/07 1:05 AM
JOHNMONTTOYA (Montoya, John)	Opened	03/26/07 9:30 AM
	Deleted	03/26/07 9:30 AM
	Emptied	04/03/07 1:04 AM
JVANJURA (Josh VanJura)	Opened	03/21/07 6:42 PM
	Deleted	03/22/07 11:22 AM
KRISPETERSON (Kris Peterson)	Opened	03/22/07 7:09 AM
LMARCHANT (Lonnie Marchant)	Opened	03/26/07 7:06 AM
LWILSON (Wilson, Lisa)	Opened	03/22/07 6:14 AM
	Deleted	04/03/07 7:55 AM
MICHELLEPAGE (Michelle Page)	Opened	03/22/07 1:22 PM
MVELASQUEZ (Mark Velasquez)	Opened	03/22/07 7:07 AM
	Forwarded	03/22/07 7:32 AM
PTANG (Tang, Peter)	Opened	03/22/07 9:34 AM

RDEBBAN (Rick Debban)	Deleted	04/03/07 12:27 PM
RITCHIETAYLOR (Taylor, Ritchie)	Opened	03/22/07 8:22 AM
	Deleted	04/04/07 10:48 AM
RPARK (Randy Park)	Opened	03/21/07 9:00 PM
	Deleted	04/01/07 8:32 PM
	Emptied	04/09/07 1:03 AM
RWIGHT (Rob Wight)	Opened	03/23/07 11:21 AM
	Forwarded	03/23/07 11:21 AM
	Replied	03/27/07 4:32 PM
TBOOTH (Booth, Teresa)	Opened	04/04/07 2:44 PM
TLRICHINS (Todd Richins)	Opened	03/22/07 3:59 PM
	Replied	03/26/07 11:57 AM
	Deleted	03/26/07 11:57 AM
	Emptied	04/03/07 1:07 AM
TNEWELL (Newell, TeriAnne)	Opened	03/21/07 8:38 PM
	Deleted	03/21/07 8:38 PM
	Emptied	03/29/07 1:06 AM
utah.gov		
SRR3PO1.SRDOMAIN	Delivered	03/21/07 6:30 PM
BSAWSAK (Barry Sawsak)	Opened	03/22/07 7:43 AM
	Deleted	04/03/07 9:02 PM
	Emptied	04/07/07 9:41 AM
BSCHVANEVELDT (Brent Schvaneveldt)	Opened	03/22/07 6:46 AM
	Forwarded	03/22/07 6:48 AM
	Deleted	03/27/07 8:24 AM
	Emptied	03/27/07 8:24 AM
CHASKELL (Haskell, Craig)	Opened	03/26/07 7:58 AM
	Deleted	03/26/07 8:00 AM
	Emptied	03/29/07 4:47 PM
DBASSETT (Doug Bassett)	Opened	03/27/07 2:38 PM
	Replied	03/27/07 8:16 PM
	Deleted	03/27/07 8:18 PM
	Emptied	03/27/07 8:18 PM
DNAZARE CC (David Nazare)	Opened	03/22/07 7:32 AM
	Deleted	03/22/07 7:33 AM
	Emptied	03/30/07 1:02 AM
ERHOADES (Ervan Rhoades)	Opened	03/22/07 8:08 AM
	Deleted	03/22/07 8:56 AM
	Emptied	03/22/07 10:51 AM
GSEARLE (Greg Searle)	Opened	03/26/07 6:38 AM
JACKLYMAN (Jack Lyman)	Opened	03/22/07 12:09 PM
	Forwarded	03/22/07 12:11 PM
	Emptied	04/05/07 7:59 AM
JCLARKSON (Clarkson, John)	Opened	03/22/07 9:18 AM
	Deleted	03/26/07 11:50 AM

JHIGGINS (Higgins, John)	Emptied	03/27/07 12:07 PM
	Opened	03/22/07 10:42 AM
	Deleted	03/22/07 10:42 AM
	Emptied	03/22/07 1:51 PM
JIMGOLDEN (Jim Golden)	Opened	03/22/07 11:28 AM
LDABLING (Dabling, Lori)	Opened	03/22/07 7:49 AM
	Emptied	03/22/07 7:52 AM
MERRELLJOLLEY (Merrell Jolley)	Opened	03/22/07 9:04 AM
PHUFF (Huff, Philip)	Opened	03/22/07 7:11 AM
	Deleted	03/30/07 10:14 AM
	Emptied	03/30/07 10:19 AM
RMARKLE (Robert Markle)	Opened	03/22/07 6:55 AM
	Deleted	04/03/07 4:33 PM
	Replied	04/03/07 4:33 PM
RWESTOVER (Robert Westover)	Opened	03/22/07 7:11 AM
	Deleted	03/22/07 7:13 AM
SACERSON (Steven Acerson)	Opened	03/22/07 11:20 AM
SCOTTANDRUS (Scott Andrus)	Opened	03/22/07 7:33 AM
STEEBONNER (Steve Bonner)	Opened	03/27/07 9:19 AM
utah.gov		
SRR4PO1.SRDOMAIN	Delivered	03/21/07 6:30 PM
AJROGERS (A J Rogers)	Opened	03/26/07 8:13 AM
	Deleted	03/27/07 4:47 PM
	Emptied	03/27/07 4:47 PM
ANNEOGDEN (Anne Ogden)	Opened	03/22/07 1:31 PM
	Replied	03/30/07 5:06 PM
BCHRISTENSEN (Brent Christensen)	Opened	03/22/07 7:41 AM
	Emptied	03/22/07 7:41 AM
	Deleted	03/22/07 7:41 AM
BSORENSEN (Bret Sorenson)	Opened	04/05/07 5:06 PM
	Emptied	04/05/07 5:10 PM
CARLJ (Carl Johnson)	Opened	03/22/07 2:30 PM
CLARKMACKAY (Clark Mackay)	Opened	03/22/07 10:13 AM
	Replied	03/27/07 7:55 AM
DBABCOCK (Dave Babcock)	Opened	03/22/07 7:13 AM
DFRIANT (Friant, Daryl)	Opened	03/22/07 10:06 AM
	Deleted	03/22/07 10:07 AM
	Emptied	03/22/07 2:49 PM
DHAWKS CC (Dal Hawks)	Opened	03/22/07 8:42 AM
DSTAPLEY (Dale Stapley)	Opened	03/22/07 6:43 AM
DWEBSTER (Dan Webster)	Opened	03/22/07 1:01 PM
FJENKINS (Fred Jenkins)	Opened	03/26/07 6:11 AM
GLEIGHTON (George Leighton)	Opened	03/22/07 6:59 AM
HKIRKHAM (Hugh Kirkham)	Opened	03/21/07 11:07 PM
	Replied	03/30/07 12:44 PM

	Deleted	03/30/07 4:47 PM
	Emptied	03/30/07 5:01 PM
JMCCONNELL (Jim McConnell)	Opened	03/22/07 1:32 PM
KMANWILL (Manwill, Kim)	Opened	03/22/07 9:40 AM
	Deleted	03/26/07 4:08 PM
	Emptied	03/26/07 4:45 PM
KTHORNOCK (Thornock, Kirk)	Opened	03/22/07 6:23 AM
KVERHAEREN (Karl Verhaeren)	Opened	03/22/07 7:07 AM
	Forwarded	03/22/07 7:26 AM
LFRIANT (Lyndon Friant)	Opened	03/22/07 7:08 AM
	Replied	04/06/07 6:57 AM
	Deleted	04/06/07 6:57 AM
LHENRIE (Les Henrie)	Opened	03/23/07 11:27 AM
LSLACK (Layne Slack)	Opened	03/22/07 7:30 AM
MARSHA (Marsha Chaston)	Opened	03/22/07 2:15 PM
	Deleted	03/27/07 4:55 PM
	Emptied	04/04/07 4:32 PM
MMILES (Mike Miles)	Opened	03/22/07 8:11 AM
	Forwarded	03/22/07 8:13 AM
	Replied	03/30/07 7:45 AM
	Emptied	03/30/07 7:45 AM
	Deleted	03/30/07 7:45 AM
MSENG (Mike Seng)	Downloaded	03/22/07 7:09 AM
	Opened	03/22/07 8:11 AM
	Replied	03/28/07 10:24 AM
	Deleted	03/28/07 10:24 AM
	Emptied	04/02/07 6:51 AM
NJEROME (Nancy Jerome)	Opened	03/28/07 12:49 PM
NMERRILL (Nathan Merrill)	Opened	03/22/07 8:18 AM
	Downloaded	04/10/07 10:34 AM
PMCGANN (Patrick McGann)	Opened	03/22/07 9:07 AM
RDOWELL (Robert Dowell)	Opened	03/22/07 7:07 AM
RNEBEKER (Robert Nebeker)	Opened	03/23/07 1:39 PM
RSCHENA (Ree Schena)	Opened	03/22/07 6:56 AM
	Deleted	03/26/07 7:57 AM
	Emptied	03/26/07 8:14 AM
RTANGREN (Russ Tangren)	Opened	03/21/07 8:12 PM
RTORGERSON (Rick Torgerson)	Opened	03/22/07 7:23 AM
	Deleted	03/22/07 7:25 AM
	Emptied	03/22/07 7:25 AM
SCOTTMUNSON (Scott Munson)	Opened	03/26/07 9:25 AM
SCOTTSNOW (Scott Snow)	Opened	03/22/07 8:00 AM
SKUNZLER (Steve Kunzler)		
SOGDEN (Steve Ogden)	Opened	03/22/07 6:59 AM
TAMERHA (Maxwell, Tamerha)	Opened	03/22/07 9:01 AM
	Emptied	04/02/07 9:19 AM

TERIPETERSON (Teri Peterson)	Opened	03/22/07 8:22 AM
	Deleted	03/22/07 8:22 AM
	Emptied	03/23/07 3:15 PM
TTORGERSEN (Troy Torgersen)	Opened	03/22/07 8:43 AM
	Replied	03/22/07 8:53 AM
	Emptied	04/10/07 10:04 AM
	Deleted	04/10/07 10:04 AM
utah.gov		
SRTCPO1.SRDOMAIN	Delivered	03/21/07 6:29 PM
DANIELLEHERRSCHER (Danielle Herrscher)	Opened	03/21/07 9:22 PM
DKINNECOM (Dave Kinnecom)		
EBRONDUM (Erik Brondum)	Opened	03/22/07 7:45 AM
ROBERTCLAYTON (Rob Clayton)	Opened	03/21/07 7:49 PM
	Replied	03/30/07 2:45 PM
TLPETERSON (Troy Peterson)	Opened	03/26/07 9:08 AM
	Replied	04/03/07 1:43 PM
utah.gov	Transferred	03/21/07 6:30 PM
JOHNEMILLER (Miller John)		

Post Office	Delivered	Route
SRCOPO1.SRDOMAIN	03/21/07 6:29 PM	civilscience.com
		dot.gov
		gcinc.com
SRCOPO1.SRDOMAIN	03/21/07 6:29 PM	utah.gov
SRR1PO1.SRDOMAIN	03/21/07 6:30 PM	utah.gov
SRR2PO1.SRDOMAIN	03/21/07 6:29 PM	utah.gov
SRR3PO1.SRDOMAIN	03/21/07 6:30 PM	utah.gov
SRR4PO1.SRDOMAIN	03/21/07 6:30 PM	utah.gov
SRTCPO1.SRDOMAIN	03/21/07 6:29 PM	utah.gov
		utah.gov

Files	Size	Date & Time
MESSAGE	1673	Wednesday, March 21, 2007 6:29 PM
TC 1-3D Summary of Changes 3-20-07.doc		29696 Wednesday, March
21, 2007 6:19 PM		
TC Sheets 1 to 3D 3-20-07.pdf	5907020	Tuesday, March 20, 2007 5:55 PM
3-20-07 Draft Submittal Sheet for TC.pdf		27670 Wednesday, March
21, 2007 6:17 PM		

Options	
Auto Delete:	No
Expiration Date:	None
Notify Recipients:	Yes

Priority:

ReplyRequested:

Return Notification:

Send Notification when Opened

Send Notification when Deleted

Concealed Subject:

Security:

To Be Delivered:

Status Tracking:

Standard

Wednesday, April 04, 2007

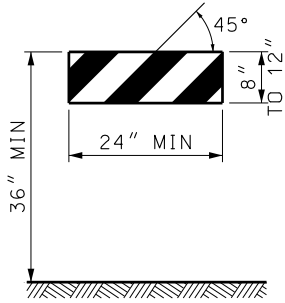
No

Standard

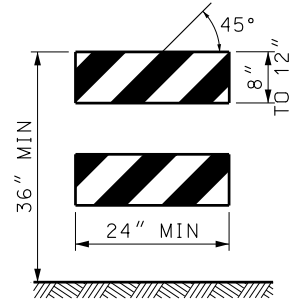
Immediate

All Information

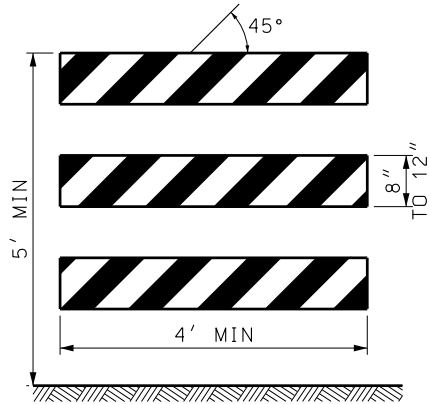
D:\11-APR-2007\11-APR-2007\Standards\Standards Committee\Meeting\11-APR-2007\11-APR-2007\Drawings\TC01A.dgn



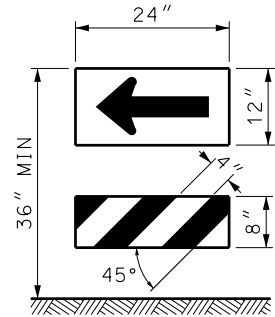
TYPE I BARRICADE



TYPE II BARRICADE



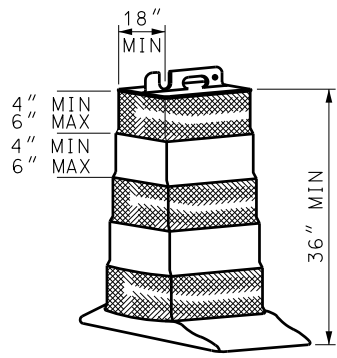
TYPE III BARRICADE



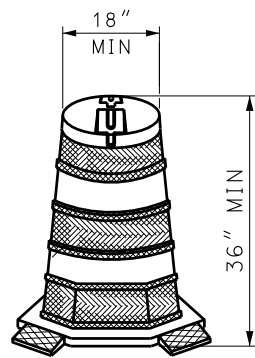
DIRECTION INDICATOR BARRICADE

BARRICADES

NOTES 1, 2, 6



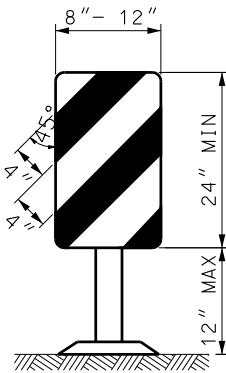
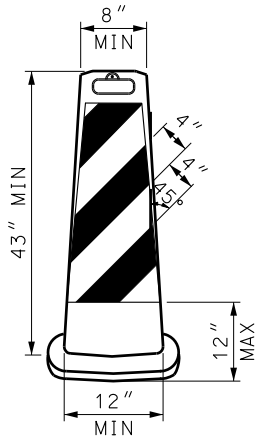
ONE-PIECE RECTANGULAR
W/RETROREFLECTIVE BANDS



TWO-PIECE ROUND
W/RETROREFLECTIVE BANDS

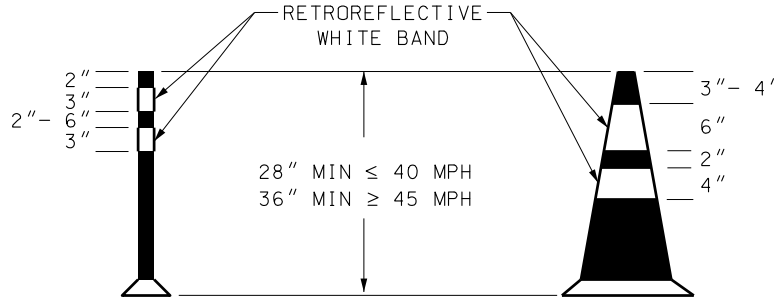
PLASTIC DRUMS

SEE NOTES 3, 5, 9



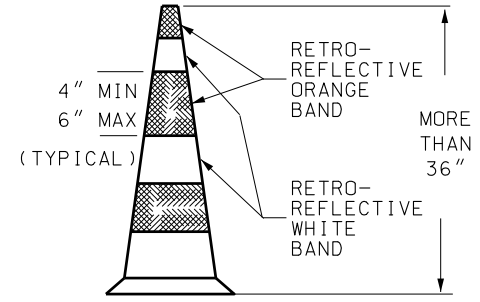
VERTICAL PANELS

SEE NOTE 1



TUBULAR MARKERS

DAYLIGHT HOURS ONLY
SEE NOTE 5



CONES

NOTES 5, 7, 8, 9, 10, 11

NOTES:

- USE A MINIMUM OF 270 SQUARE INCHES OF RETROREFLECTIVE MATERIAL PLACED A MINIMUM OF 12 INCHES ABOVE THE ROADWAY SURFACE ON BARRICADES AND VERTICAL PANELS WHEN USED ON FREEWAYS OR ROADWAYS WITH A POSTED SPEED GREATER THAN 45 MPH. PLACE BARRICADES AND VERTICAL PANELS IN SUCH A MANNER THAT THEY ARE VISIBLE TO APPROACHING TRAFFIC.
- USE SANDBAGS WITH SAND OR OTHER COMPARABLE SOFT MATERIAL AS BALLAST. DO NOT PLACE BALLAST HIGHER THAN 12 INCHES ABOVE THE ROADWAY AND DO NOT COVER ANY REFLECTIVE AREA OF RAILS OR SIGNS.
- USE PLASTIC DRUMS OR DIRECTIONAL BARRICADES AS LANE CLOSURE TAPER DEVICES FOR SPEEDS 50 MPH AND GREATER.
- USE TUBULAR MARKERS FOR DAY-TIME USE ONLY.
- WHEN DRUMS, CONES, OR TUBULAR MARKERS ARE USED TO CHANNELIZE PEDESTRIANS, LOCATE THEM SUCH THAT THERE ARE NO GAPS BETWEEN THE BASES OF THE DEVICES IN ORDER TO CREATE A CONTINUOUS BOTTOM, AND THE HEIGHT OF EACH INDIVIDUAL DRUM, CONE, OR TUBULAR MARKER IS NO LESS THAN 36 INCHES TO BE DETECTABLE TO USERS OF LONG CANES. WHEN BARRICADES ARE USED TO CHANNELIZE PEDESTRIANS, THE BOTTOM OF THE BOTTOM RAIL WILL BE NO HIGHER THAN 6 INCHES OFF THE GROUND IN ADDITION TO THE ABOVE REQUIREMENTS.
- USE A DIRECTION INDICATOR BARRICADE WITH A ONE-DIRECTION LARGE ARROW (W1-6) SIGN MOUNTED ABOVE A DIAGONAL STRIPED, HORIZONTALLY ALIGNED, RETROREFLECTIVE RAIL.
- USE REFLECTORIZED CONES DURING NIGHTTIME FOR MAXIMUM VISIBILITY.
- PROVIDE RETROREFLECTORIZATION OF CONES THAT ARE 28 TO 36 INCHES IN HEIGHT BY USING A 6 INCH WIDE WHITE BAND LOCATED 3 TO 4 INCHES FROM THE TOP OF THE CONE AND AN ADDITIONAL 4 INCH WIDE WHITE BAND LOCATED APPROXIMATELY 2 INCHES BELOW THE 6 INCH BAND.
- PROVIDE RETROREFLECTORIZATION OF CONES THAT ARE MORE THAN 36 INCHES IN HEIGHT BY USING HORIZONTAL, CIRCUMFERENTIAL, ALTERNATING ORANGE AND WHITE RETROREFLECTIVE STRIPES THAT ARE 4 TO 6 INCHES WIDE. USE A MINIMUM OF TWO ORANGE AND TWO WHITE STRIPES FOR EACH CONE, WITH THE TOP STRIPE BEING ORANGE. DO NOT EXCEED 3 INCHES IN WIDTH FOR ANY NON- RETROREFLECTIVE SPACES BETWEEN THE ORANGE AND WHITE STRIPES
- DO NOT USE CONES DURING NIGHTTIME ON FREEWAYS, DIVIDED HIGHWAYS, OR ROADS WITH A SPEED OF 55 MPH OR GREATER. THIS RESTRICTION DOES NOT APPLY TO PAVEMENT MARKING OPERATIONS.
- DO NOT USE CONES FOR LONG TERM STATIONARY OPERATIONS. CONES WILL BE REMOVED FROM THE ROADWAY AT THE END OF EACH WORKDAY, WITH THE FOLLOWING EXCEPTION:

CONES MAY BE USED FOR UP TO 3 DAYS/2NIGHTS FOR OPERATIONS WHERE WORKERS ARE CONTINUALLY PRESENT AND WORK IS ACTIVELY UNDERWAY. CONES WILL BE REPLACED WITH VERTICAL PANELS, DRUMS, AND/OR BARRICADES WHEN WORKERS ARE NO LONGER PRESENT, OR WHEN WORK EXTENDS THROUGH ADDITIONAL NIGHTS.

UTAH DEPARTMENT OF TRANSPORTATION
STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION

WORK ZONE
CHANNELIZATION
DEVICES

STD DWG
TC 1A

REVISIONS

DATE

DATE

DATE

DATE

DATE

DATE

DATE

DATE

DATE

DATE

DATE

DATE

DATE

DATE

DATE

DATE

DATE

DATE

DATE

DATE

DATE

DATE

DATE

DATE

DATE

DATE

DATE

DATE

DATE

DATE

DATE

DATE

DATE

DATE

DATE

DATE

DATE

DATE

DATE

DATE

DATE

DATE

DATE

DATE

DATE

DATE

DATE

DATE

DATE

DATE

DATE

DATE

DATE

DATE

DATE

DATE

DATE

DATE

DATE

DATE

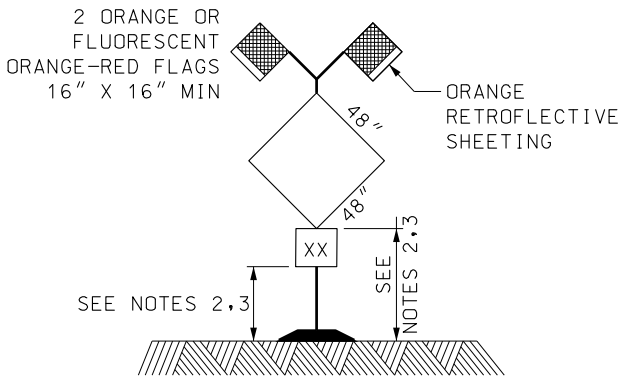
DATE

DATE

DATE

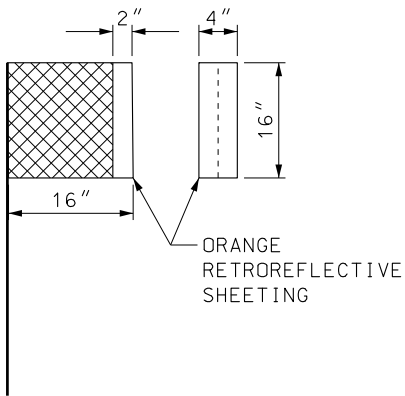


NOTES 1, 6



TYPICAL PORTABLE SIGN SUPPORTS
INSTALLATION WITH FLAGS

SEE NOTES 4, 5, 6



FLAG DETAIL

SEE NOTE 8

NOTES:

1. CLOSE ROADWAYS WITH TYPE III BARRICADES. EXTEND THE BARRICADES ACROSS INTENDED ROAD CLOSURE A MINIMUM OF $\frac{3}{4}$ OF THE ROADWAY STARTING FROM THE CENTER OF THE ROADWAY AND EXTENDING IN BOTH DIRECTIONS TOWARD THE SHOULDERS. PLACE A "ROAD CLOSED" SIGN (R11-2) OVER THE CENTER LINE AND THE APPROPRIATE "DETOUR" ARROW SIGNS (M4-10 L OR R) ON EACH SIDE OF THE "ROAD CLOSED" SIGN. DETOUR ARROWS ARE NOT REQUIRED IF DETOUR IS NOT AT ROAD CLOSURE.
2. USE A 12 INCH MINIMUM MOUNTING HEIGHT TO THE BOTTOM OF THE LOWEST SIGN FOR SIGNS ON PORTABLE SUPPORTS.
3. USE A 36 INCH MINIMUM MOUNTING HEIGHT TO THE BOTTOM OF THE LOWEST SIGN FOR SIGNS ON PORTABLE SUPPORTS PLACED AMONG CHANNELIZING DEVICES.
4. USE A MINIMUM 84 INCH MOUNTING HEIGHT FROM ROADWAY SURFACE FOR SIGNS USING POST TYPES P1, P2 OR P3. REFER TO SN SERIES STANDARD DRAWINGS.
5. PLACE TWO ORANGE STRIPS OF RETROREFLECTIVE SHEETING, 4 INCHES x 24 INCHES, VERTICALLY, 12 INCHES FROM THE RIGHT AND LEFT CORNERS ON THE BACK OF SIGNS USED WITH PORTABLE SUPPORTS.
6. USE SANDBAGS WITH SAND OR OTHER COMPARABLE SOFT MATERIAL AS BALLAST. DO NOT PLACE BALLAST HIGHER THAN 12 INCHES ABOVE THE ROADWAY AND DO NOT COVER ANY REFLECTIVE AREA OF RAILS OR SIGNS.
7. SIGNS ON PORTABLE SUPPORTS MAY BE USED FOR 7 DAYS OR LESS. USE PERMANENTLY MOUNTED SIGNS FOR LONGER THAN 7 DAYS UNLESS USE OF PORTABLE SIGN SUPPORTS RECEIVES APPROVAL FROM THE REGION TRAFFIC ENGINEER.
8. USE 4 INCH x 16 INCH ORANGE RETROREFLECTIVE SHEETING SECURELY FASTENED TO THE OUTSIDE EDGE OF THE FLAG. ENSURE TWO INCHES OF THE SHEETING IS VISIBLE FROM EACH SIDE.

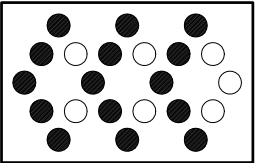
REVISIONS			
NO.	DATE	APPR.	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION SALT LAKE CITY	RECOMMENDED FOR APPROVAL CHAIRMAN STANDARD COMMITTEE APPROVED	DATE FEB.23.2006	DATE FEB.23.2006
DEPUTY DIRECTOR			

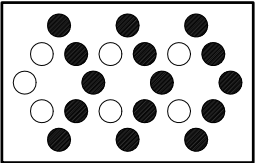
WORK ZONE SIGNING	STANDARD DRAWING TITLE
STD DWG TC 1B	Doc Page 304

ARROW PANELS

CHEVRON ARROW



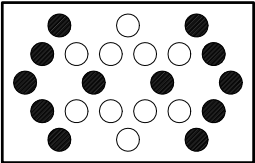
MERGE LEFT



MERGE RIGHT

SEE NOTE 3

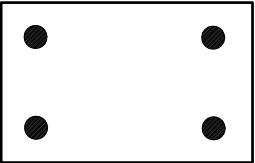
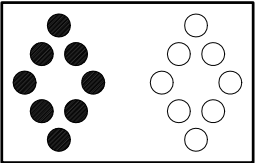
FLASHING
DOUBLE ARROW



MERGE RIGHT OR LEFT

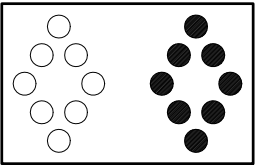
FLASHING
CAUTION

SEE NOTE 2



FOUR - CORNER

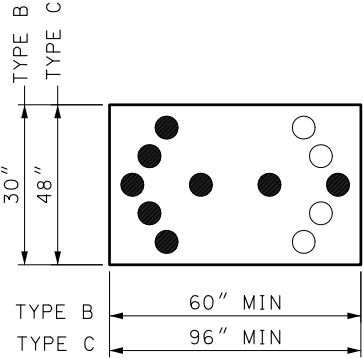
FEDERAL-FUNDED PROJECTS ONLY



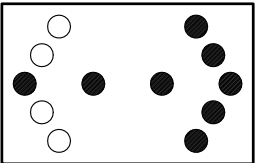
DANCING DIAMONDS

STATE MAINTENANCE AND
STATE-FUNDED PROJECTS ONLY

FLASHING ARROW
(OPTIONAL)
SEE NOTE 4



MERGE LEFT



MERGE RIGHT

NOTES:

1. PLACE THE BOTTOM EDGE OF THE ADVANCE WARNING ARROW PANELS A MINIMUM OF 7 FEET ABOVE THE ROADWAY SURFACE.
2. DO NOT USE FLASHING LINE FOR CAUTION MODE.
3. SEQUENTIAL ARROW MAY BE USED.
4. FLASHING ARROW MAY ONLY BE USED ON A 12 ELEMENT DISPLAY.
5. USE SHOULDER TAPER TO DELINEATE ARROW PANEL WHEN ON SHOULDER.
6. TYPE B - 4" DIA SEALED-BEAM ELEMENT
TYPE C - 5" DIA SEALED-BEAM ELEMENT

UTAH DEPARTMENT OF TRANSPORTATION

STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION

RECOMMENDED FOR APPROVAL

CHAIRMAN STANDARDS COMMITTEE

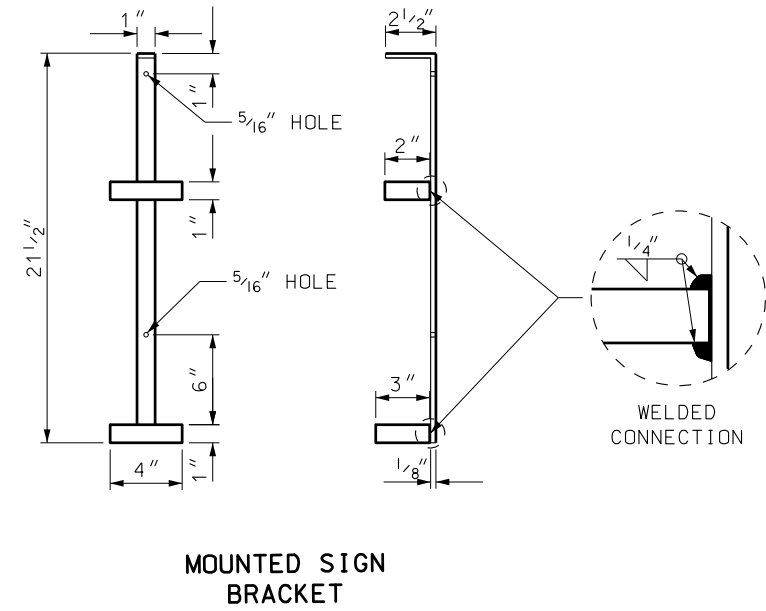
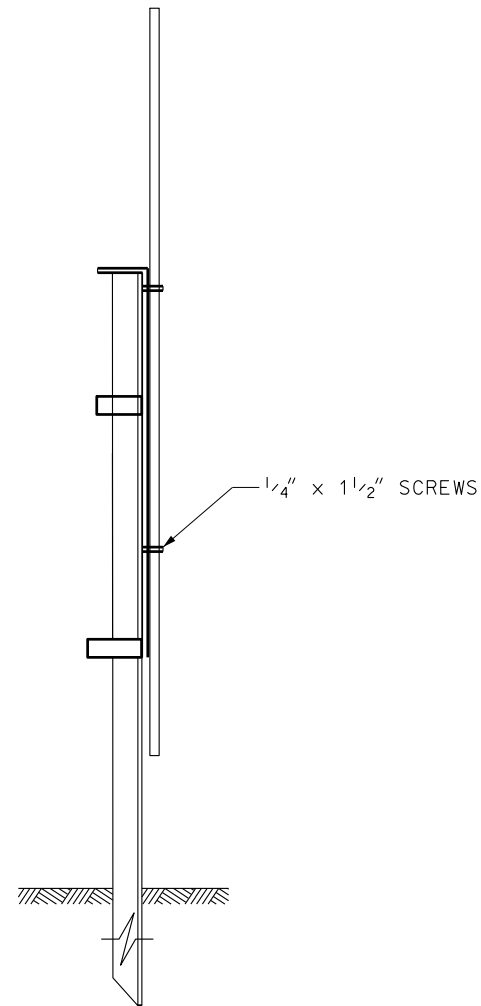
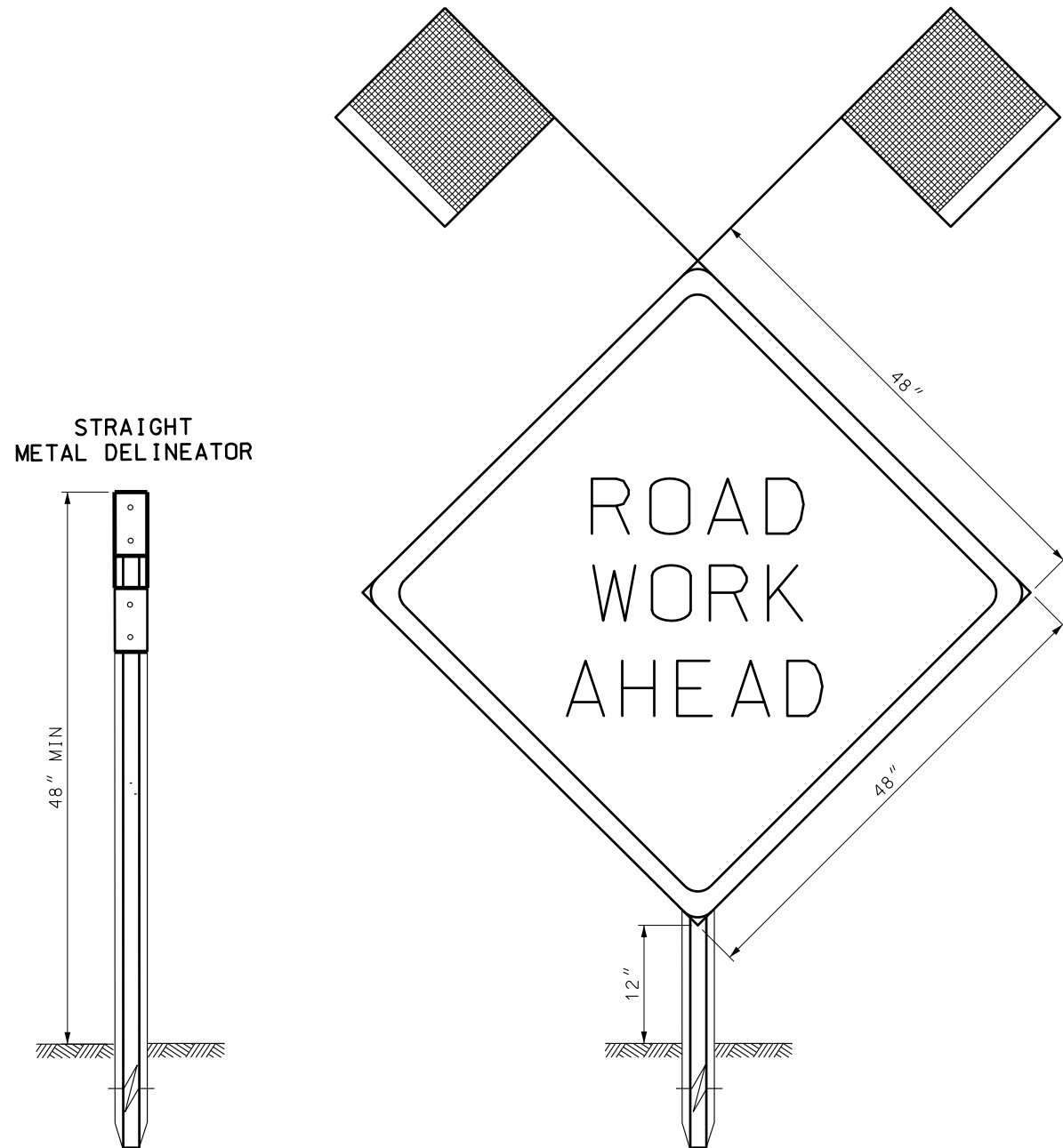
APPROVED

DEPUTY DIRECTOR

WORK ZONE
ADVANCED WARNING
ARROW PANELS

STANDARD DRAWING TITLE

STD DWG
TC 1C



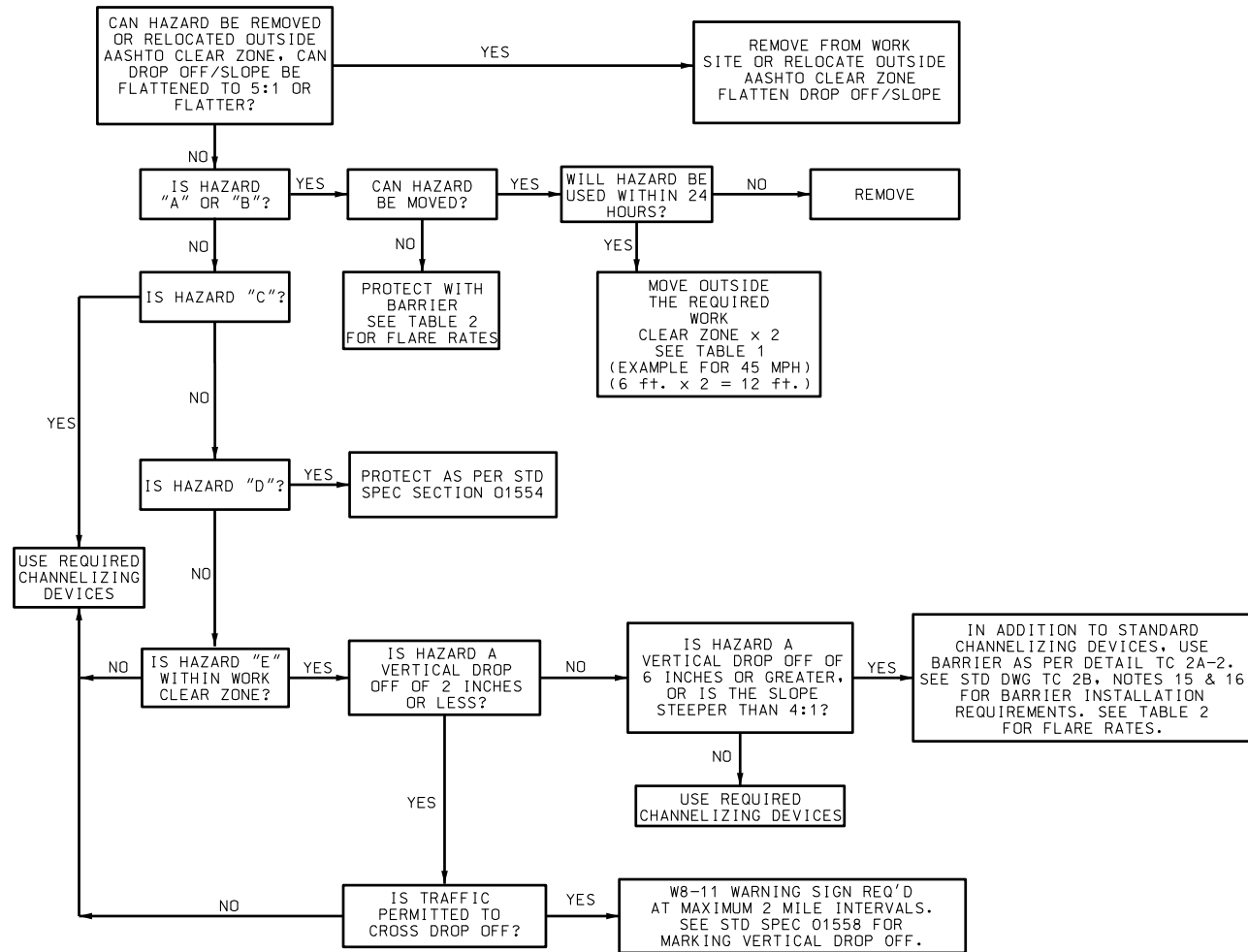
NOTES:

1. USE DURING DAYLIGHT PERIOD ONLY.
2. REMOVE BRACKET AND SIGN PRIOR TO NIGHTTIME.
3. USE ON METAL DELINEATOR POST ONLY.
4. USE ASTM A36 STEEL FOR BRACKET. WELD SQUARE LOOPS ONTO VERTICAL METAL PIECE. PAINT OR GALVANIZE SIGN BRACKET AFTER WELDING IS COMPLETED.
5. USE SCREWS TO ATTACH TRAFFIC CONTROL SIGN TO BRACKET THROUGH THE TWO 5/16" HOLES.

[illegible]

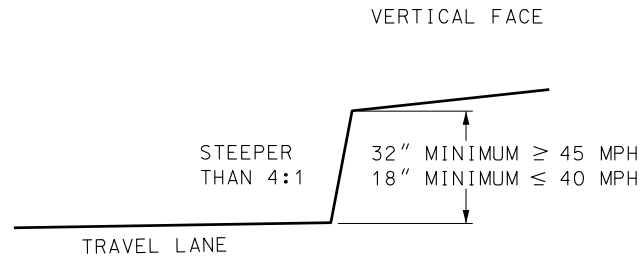
HAZARD MITIGATION

- USE DETAIL TC 2A-1 AND TABLE 1 (WORK CLEAR ZONE) WHEN MITIGATING THE FOLLOWING HAZARDS:
 - NON-WORKING EQUIPMENT OR VEHICLES
 - STOCKPILED MATERIAL
 - WORKING VEHICLES AND WORKERS (NON-FLAGGERS)
 - OTHER OBJECTS AND FEATURES (I.E.: BRIDGE PARAPETS, BARRIER BLUNT ENDS, POLES)
 - SLOPES STEEPER THAN 4:1 OR A VERTICAL DROP OFF* OF LESS THAN 48 INCHES (SEE DETAIL TC 2A-2 FOR EXAMPLES)
- MITIGATE ALL OTHER HAZARDS, SLOPES STEEPER THAN 4:1, OR VERTICAL DROP OFFS* 48 INCHES OR GREATER WITHIN AASHTO CLEAR ZONE AS APPROVED BY THE REGION TRAFFIC ENGINEER.

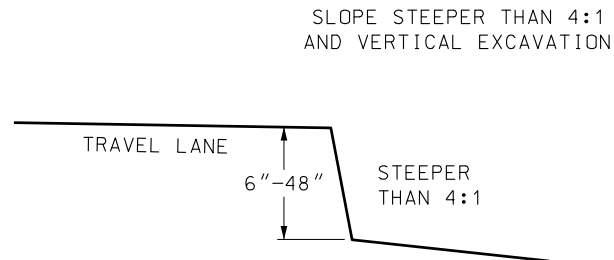


DETAIL TC 2A-1

* DROP OFF IS A VERTICAL DIFFERENCE THAT MAY BE FROM THE WORK TO THE ROADWAY OR THE ROADWAY TO THE WORK.



BARRIER REQUIRED UNLESS FORESLOPE IS A SMOOTH UNIFORM SURFACE OF SUITABLE MATERIAL TO REMAIN STABLE AND NOT SPALL AT SPEED AND HEIGHT SHOWN



WITHIN WORK CLEAR ZONE USE BARRIER

OUTSIDE WORK CLEAR ZONE USE DEVICES

> 48" OBTAIN APPROVAL FROM REGION TRAFFIC ENGINEER

TYPE "E" VERTICAL DROP OFF HAZARDS DETAIL TC 2A-2

TABLE 1 WORK CLEAR ZONE	
MPH	FEET
40 & LESS	3
45	6
50	6.5
55	7.5
60	8
65	8.5
70	9
75	10.5

TABLE 2 WORK ZONE FLARE RATES TEMPORARY BARRIER	
MPH	FLARE
70	20:1
65	18:1
60	17:1
55	16:1
50	14:1
45	10:1
40	6:1

UTAH DEPARTMENT OF TRANSPORTATION
STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION

RECOMMENDED FOR APPROVAL
CHAIRMAN STANDARDS COMMITTEE
APPROVED
DEPUTY DIRECTOR

HAZARD
MITIGATION

STANDARD DRAWING TITLE

STD DWG
TC 2A

NOTES:

1. USE CURRENT EDITION OF UDOT STANDARDS FOR TRAFFIC CONTROL. USE THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) FOR TRAFFIC CONTROL ELEMENTS NOT SHOWN IN THE TC STD DWG SERIES.
2. USE CURRENT EDITION OF STANDARD HIGHWAY SIGNS MANUAL FOR SIZE AND DESIGN OF STANDARD SIGNS.
3. SEE STD DWG TC 1A AND TC 1B FOR WORK ZONE SIGNING AND DEVICE REQUIREMENTS.
4. USE MINIMUM 48" x 48" SIZE FOR DIAMOND WORK ZONE WARNING SIGNS.
5. COVER OR REMOVE NON-APPLICABLE SIGNING, BOTH EXISTING AND WORK ZONE SIGNS.
6. REMOVE NON-APPLICABLE PAVEMENT MARKINGS FOR OPERATIONS LONGER THAN 3 DAYS.
7. REMOVE OR RELOCATE NON-APPLICABLE PORTABLE SIGN SUPPORTS AND SIGNS TWICE THE WORK CLEAR ZONE (WCZ) DISTANCE, SEE SHEET TC 2A, TABLE 1.
8. REFER TO STANDARD SPECIFICATION 01554 FOR FLAGGING REQUIREMENTS AT OPERATING TRAFFIC SIGNALS.
9. USE A FULL LANE CLOSURE WHEN WORK ENCROACHES INTO A TRAVEL LANE.
10. CLEAN AND/OR RESTORE PAVEMENT MARKINGS AT THE END OF EACH DAY'S OPERATION, BOTH ON AND OFF THE PROJECT, THAT ARE OBSCURED BY WORK OPERATIONS.
11. OBTAIN APPROVAL FOR REGULATORY AND ADVISORY SPEED REDUCTIONS THROUGH THE REGION TRAFFIC ENGINEER. USE SPEED REDUCTIONS ONLY DURING IMPACTED TIMES AND AREAS. RESTORE EXISTING REGULATORY SPEED LIMIT PRIOR TO WORK AT LOCATIONS WHERE TRAFFIC IS NOT BEING IMPACTED BY WORK ACTIVITIES. SEE POLICY 06C-61.
12. USE THE POSTED SPEED LIMIT PRIOR TO WORK ZONE TO COMPUTE THE SIGN SPACING, TAPER LENGTH, BUFFER ZONE, AND WORK CLEAR ZONE DISTANCES. USE THE WORK ZONE POSTED SPEED LIMIT TO DETERMINE THE TANGENT SPACING FOR CHANNELIZING DEVICES.
13. USE PLASTIC DRUMS FOR LANE CLOSURE TAPER DEVICES FOR SPEEDS OF 50 MPH AND GREATER.
14. USE A DOWNSTREAM TAPER FOR OPERATIONS LONGER THAN 3 DAYS.
15. PLACE AN ARROW PANEL ON THE SHOULDER OF THE ROADWAY OR, IF PRACTICAL, FURTHER FROM THE TRAVELED LANE. WHEN NO ADEQUATE SHOULDER IS AVAILABLE, PLACE ARROW PANEL IN FIRST 1/3 OF TAPER IN THE CLOSED LANE. IT SHOULD BE DELINEATED WITH RETROREFLECTIVE TEMPORARY TRAFFIC CONTROL (TTC) DEVICES. WHEN AN ARROW PANEL IS NOT BEING USED, IT SHOULD BE REMOVED; IF NOT REMOVED, IT SHOULD BE SHIELDED; OR IF THE PREVIOUS TWO OPTIONS ARE NOT FEASIBLE, IT SHOULD BE DELINEATED WITH RETRORELECTIVE TTC DEVICES.
16. USE AN APPROVED WORK ZONE ATTENUATOR SYSTEM WITH TEMPORARY PRECAST CONCRETE BARRIER WHEN APPROACH ENDS ARE WITHIN THE AASHTO CLEAR ZONE. APPROVED TRUCK MOUNTED ATTENUATOR SYSTEM MAY BE USED FOR ONLY 24 HOURS OR LESS.
17. USE PROPER LENGTH OF NEED FOR TEMPORARY BARRIER AS PER THE REQUIREMENTS OF THE CURRENT EDITION OF THE ROADSIDE DESIGN GUIDE. USE POSTED SPEED LIMIT PRIOR TO THE WORK ZONE FOR THE DESIGN OF THE REQUIRED LENGTH OF NEED. SEE SHEET TC 2A FOR THE WORK ZONE FLARE RATE REQUIREMENT FOR TEMPORARY BARRIER. APPROVAL FROM THE REGION TRAFFIC ENGINEER IS REQUIRED FOR MODIFICATION TO THE REQUIRED FLARE RATE.
18. USE BUMP SIGN (W8-1) WHEN METAL PLATES ARE PLACED ON THE ROADWAY.
19. USE SUPPLEMENTAL LEFT SIDE SIGNING FOR HIGH-SPEED DIVIDED HIGHWAYS.

UTAH DEPARTMENT OF TRANSPORTATION

STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION

RECOMMENDED FOR APPROVAL

CHAIRMAN STANDARDS COMMITTEE

APPROVED

DEPUTY DIRECTOR

GENERAL
NOTES

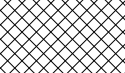
STANDARD DRAWING TITLE

STD DWG
TC 2B

REVISIONS

REMARKS

TAPER, BUFFER ZONE & SIGN SPACING CHART

ROAD TYPE	POSTED SPEED MPH (S)	MINIMUM TAPER LENGTH(L)	LENGTH OF BUFFER(BZ)	MINIMUM SIGN SPACING (SS)				ONE LANE TWO-WAY FLAGGING
		12' LANE CLOSURE	DESIRABLE	A	B	C	D	TAPER LENGTH
		feet	feet	feet	feet	feet	feet	feet
CONVENTIONAL	30 AND LOWER	180	200	100	100	100	100	50
	35	245	250	350	350	350	175	
	40	320	305					
	45	540	360	500	500	500	250	100
	50	600	425					
	55	660	495					
	60	720	570					
	65	780	645					
FREEWAY/ EXPRESSWAY	65	780	645	1000	1640	2640	500	
	70	840	730					
	75	900	820					

1- TAPER LENGTH FORMULAS

SPEED	FORMULA
FOR SPEEDS OF 40 MPH AND LESS	$L = \frac{WS^2}{60}$
FOR SPEEDS OF 45 MPH AND GREATER	$L = WS$

WHERE:
L = TAPER LENGTH IN FEET
W = WIDTH OF OFFSET IN FEET
S = SPEED IN MPH

1/3 L = FOR SHOULDER CLOSURE TAPER
1/2 L = FOR LANE SHIFT TAPER

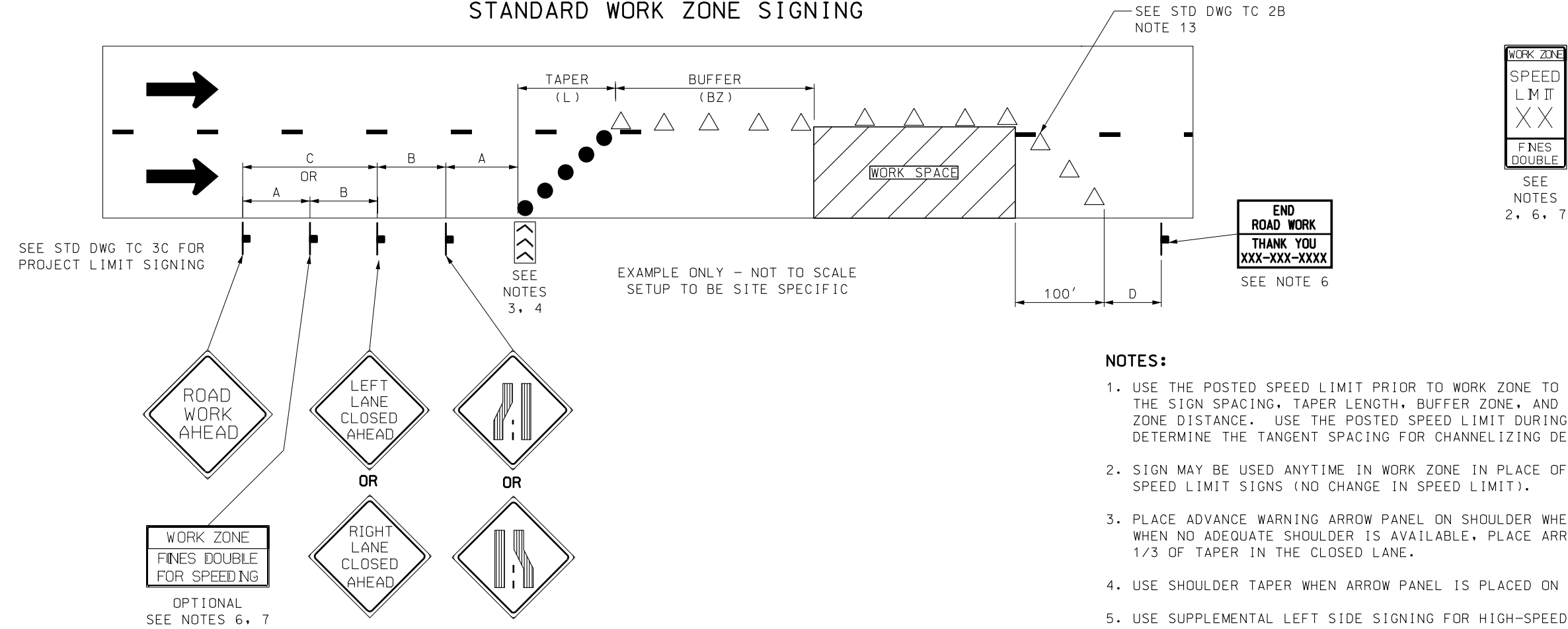
2- CHANNELIZING DEVICES

- A) MERGING AND SHIFTING TAPERS: USE A MINIMUM OF 1 DEVICE PER FOOT OF LANE CLOSURE, PLUS 1 ADDITIONAL DEVICE TO START.
- B) SHOULDER, ONE-LANE TWO-WAY, AND DOWNSTREAM TAPERS: USE A MINIMUM OF 1 DEVICE PER 3 FEET OF WIDTH (OR PORTION THEREOF), PLUS 1 ADDITIONAL DEVICE TO START.
- C) ON TANGENT: $S \times 2 =$ SPACING UP TO 120 FEET MAXIMUM.
- D) LENGTH OF BUFFER ZONE (BZ) IS THE DISTANCE FROM END OF LANE CLOSURE TAPER TO WORK SPACE, OR ANY OBSTRUCTION PRIOR TO WORK SPACE.

TRAFFIC CONTROL DEVICE LEGEND

- SIGN (FIXED OR PORTABLE)
- CHANNELIZING DEVICE (SEE STD DWG TC 1A)
- PLASTIC DRUMS/DIRECTIONAL INDICATOR BARRICADE
- FLAGGING STATION
- ADVANCE WARNING ARROW PANEL
- BARRIER
- DIRECTION OF TRAFFIC
- TYPE III BARRICADE
- DIRECTION OF WORK VEHICLE

STANDARD WORK ZONE SIGNING



NOTES:

- USE THE POSTED SPEED LIMIT PRIOR TO WORK ZONE TO COMPUTE THE SIGN SPACING, TAPER LENGTH, BUFFER ZONE, AND WORK CLEAR ZONE DISTANCE. USE THE POSTED SPEED LIMIT DURING WORK TO DETERMINE THE TANGENT SPACING FOR CHANNELIZING DEVICES.
- SIGN MAY BE USED ANYTIME IN WORK ZONE IN PLACE OF EXISTING SPEED LIMIT SIGNS (NO CHANGE IN SPEED LIMIT).
- PLACE ADVANCE WARNING ARROW PANEL ON SHOULDER WHEN AVAILABLE. WHEN NO ADEQUATE SHOULDER IS AVAILABLE, PLACE ARROW PANEL IN FIRST 1/3 OF TAPER IN THE CLOSED LANE.
- USE SHOULDER TAPER WHEN ARROW PANEL IS PLACED ON SHOULDER.
- USE SUPPLEMENTAL LEFT SIDE SIGNING FOR HIGH-SPEED DIVIDED HIGHWAYS.
- SEE STD DWG TC 3D FOR SIGN DESIGN AND LAYOUT.
- USE "FINES DOUBLE" SIGNING AT ALL MAJOR INTERSECTIONS/INTERCHANGES WITHIN THE PROJECT WHEN "FINES DOUBLE" OPTION IS USED.

UTAH DEPARTMENT OF TRANSPORTATION

STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION

RECOMMENDED FOR APPROVAL

CHAIRMAN STANDARDS COMMITTEE

APPROVED

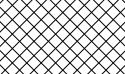
DEPUTY DIRECTOR

STANDARD WORK
ZONE SIGNING
GENERAL

STD DWG
TC 3A

STANDARD DRAWING TITLE

TAPER, BUFFER ZONE & SIGN SPACING CHART

ROAD TYPE	POSTED SPEED MPH (S)	MINIMUM TAPER LENGTH(L)	LENGTH OF BUFFER(BZ)	MINIMUM SIGN SPACING (SS)				ONE LANE TWO-WAY FLAGGING
		12' LANE CLOSURE	DESIRABLE	A	B	C	D	TAPER LENGTH
		feet	feet	feet	feet	feet	feet	feet
CONVENTIONAL	30 AND LOWER	180	200	100	100	100	100	50
	35	245	250	350	350	350	175	
	40	320	305					
	45	540	360	500	500	500	250	100
	50	600	425					
	55	660	495					
	60	720	570					
	65	780	645					
FREEWAY/ EXPRESSWAY	65	780	645	1000	1640	2640	500	
	70	840	730					
	75	900	820					

1- TAPER LENGTH FORMULAS

SPEED	FORMULA
FOR SPEEDS OF 40 MPH AND LESS	$L = \frac{WS^2}{60}$
FOR SPEEDS OF 45 MPH AND GREATER	$L = WS$

WHERE:

L = TAPER LENGTH IN FEET
W = WIDTH OF OFFSET IN FEET
S = SPEED IN MPH

1/3 L = FOR SHOULDER TAPER

1/2 L = FOR SHIFTING TAPER

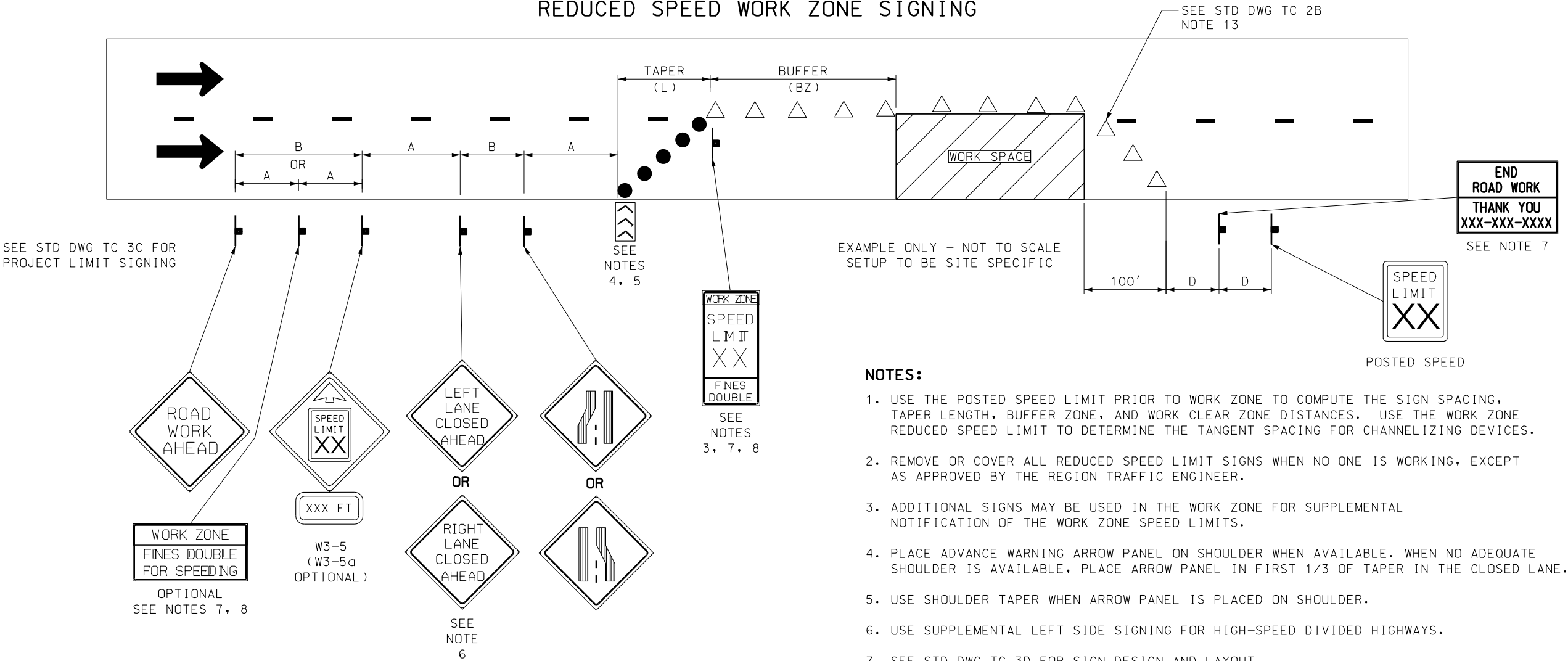
2- CHANNELIZING DEVICES

- A) MERGING AND SHIFTING TAPERS: USE A MINIMUM OF 1 DEVICE PER FOOT OF LANE CLOSURE, PLUS 1 ADDITIONAL DEVICE TO START.
- B) SHOULDER, ONE-LANE TWO-WAY, AND DOWNSTREAM TAPERS: USE A MINIMUM OF 1 DEVICE PER 3 FEET OF WIDTH (OR PORTION THEREOF), PLUS 1 ADDITIONAL DEVICE TO START.
- C) ON TANGENT: $S \times 2 =$ SPACING UP TO 120 FEET MAXIMUM.
- D) LENGTH OF BUFFER ZONE (BZ) IS THE DISTANCE FROM END OF LANE CLOSURE TAPER TO WORK SPACE, OR ANY OBSTRUCTION PRIOR TO WORK SPACE.

TRAFFIC CONTROL DEVICE LEGEND

- SIGN (FIXED OR PORTABLE)
- CHANNELIZING DEVICE (SEE STD DWG TC 1A)
- PLASTIC DRUMS/DIRECTIONAL INDICATOR BARRICADE
- FLAGGING STATION
- ADVANCE WARNING ARROW PANEL
- BARRIER
- DIRECTION OF TRAFFIC
- TYPE III BARRICADE
- DIRECTION OF WORK VEHICLE

REDUCED SPEED WORK ZONE SIGNING



NOTES:

- USE THE POSTED SPEED LIMIT PRIOR TO WORK ZONE TO COMPUTE THE SIGN SPACING, TAPER LENGTH, BUFFER ZONE, AND WORK CLEAR ZONE DISTANCES. USE THE WORK ZONE REDUCED SPEED LIMIT TO DETERMINE THE TANGENT SPACING FOR CHANNELIZING DEVICES.
- REMOVE OR COVER ALL REDUCED SPEED LIMIT SIGNS WHEN NO ONE IS WORKING, EXCEPT AS APPROVED BY THE REGION TRAFFIC ENGINEER.
- ADDITIONAL SIGNS MAY BE USED IN THE WORK ZONE FOR SUPPLEMENTAL NOTIFICATION OF THE WORK ZONE SPEED LIMITS.
- PLACE ADVANCE WARNING ARROW PANEL ON SHOULDER WHEN AVAILABLE. WHEN NO ADEQUATE SHOULDER IS AVAILABLE, PLACE ARROW PANEL IN FIRST 1/3 OF TAPER IN THE CLOSED LANE.
- USE SHOULDER TAPER WHEN ARROW PANEL IS PLACED ON SHOULDER.
- USE SUPPLEMENTAL LEFT SIDE SIGNING FOR HIGH-SPEED DIVIDED HIGHWAYS.
- SEE STD DWG TC 3D FOR SIGN DESIGN AND LAYOUT.
- USE "FINES DOUBLE" SIGNING AND SPEED LIMIT SIGNING AT ALL MAJOR INTERSECTIONS/INTERCHANGES WITHIN THE PROJECT WHEN REDUCED SPEEDS AND/OR "FINES DOUBLE" OPTION IS USED.

UTAH DEPARTMENT OF TRANSPORTATION

STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION

SALT LAKE CITY

RECOMMENDED FOR APPROVAL

CHAIRMAN STANDARDS COMMITTEE

APPROVED

DEPUTY DIRECTOR

REDUCED SPEED WORK
ZONE SIGNING
GENERAL

STANDARD DRAWING TITLE

STD DWG
TC 3B

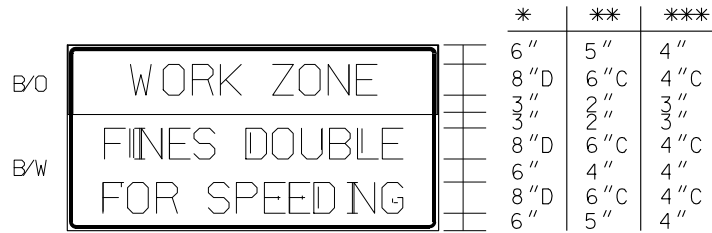


DIVIDED ROADWAYS (DETAIL TC 3C-3)

ROAD WORK
NEXT XX MILES
SEE NOTE 1

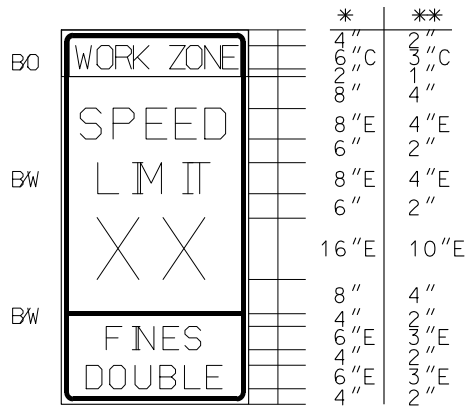
Doc
Page
311

D:\11-APR-2007\11-APR-2007\Standards\Standards Committee\Meeting\11-APR-2007\11-APR-2007\Drawings\TC030.dgn



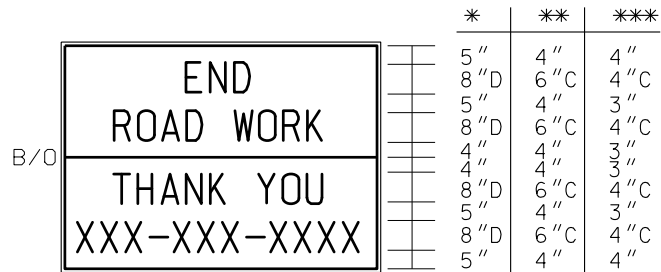
- * 96" X 48" FREEWAY/EXPRESSWAY
- ** 60" X 36" CONVENTIONAL ROADS \geq 45 MPH
- *** 42" X 30" CONVENTIONAL ROADS \leq 40 MPH

FINES DOUBLE SIGN



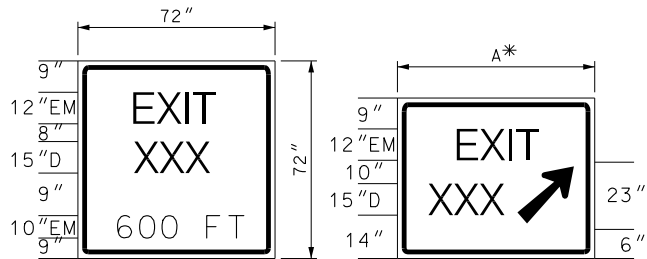
- * 48" X 96" FREEWAY/EXPRESSWAY
 - ** 24" X 48" CONVENTIONAL ROADS
- SEE NOTE 7

FINES DOUBLE SPEED LIMIT ASSEMBLY



END ROAD WORK INFORMATION SIGN

- * 84" X 60" FREEWAY/EXPRESSWAY
 - ** 60" X 48" CONVENTIONAL ROADS \geq 45 MPH
 - *** 42" X 36" CONVENTIONAL ROADS \leq 40 MPH
- XXX CONTRACTOR'S PHONE NUMBER
NO INTERNET OR EMAIL ADDRESSES



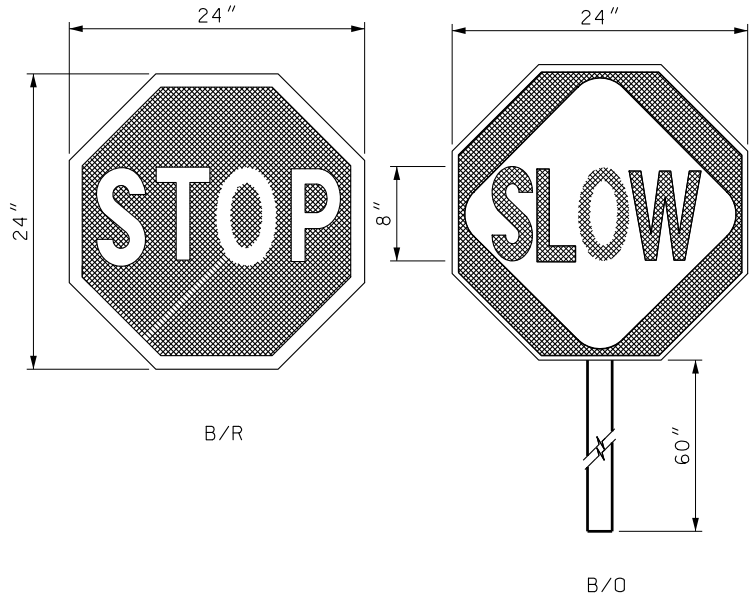
- SEE NOTE 8
* SEE TABLE 1 FOR WIDTH

EXIT RAMP SIGNING

B/O
XXX EXIT NUMBER

EXIT RAMP SIGN	
NUMBER OF DIGITS	A
X	72"
XX	90"
XXX	108"

TABLE 1



FLAGGER STOP/SLOW PADDLE

NOTES:

1. USE THE POSTED SPEED LIMIT PRIOR TO WORK ZONE TO COMPUTE THE SIGN SPACING, TAPER LENGTH, BUFFER ZONE, AND WORK/CONSTRUCTION CLEAR ZONE DISTANCE. USE THE POSTED SPEED LIMIT DURING WORK TO DETERMINE THE TANGENT SPACING FOR CHANNELIZING DEVICES.
2. USE A 12 INCH MINIMUM MOUNTING HEIGHT TO THE BOTTOM OF THE LOWEST SIGN FOR SIGN ON PORTABLE STANDS.
3. USE SANDBAGS WITH SAND OR OTHER COMPARABLE SOFT MATERIAL AS BALLAST. DO NOT PLACE BALLAST HIGHER THAN 12 INCHES ABOVE THE ROADWAY AND DO NOT COVER ANY REFLECTIVE AREA OF RAILS OR SIGNS.
4. USE A 36 INCH MINIMUM MOUNTING HEIGHT TO THE BOTTOM OF THE LOWEST SIGN FOR SIGNS ON PORTABLE STANDS PLACED AMONG CHANNELIZING DEVICES.
5. SIGNS ON PORTABLE SUPPORTS MAY ONLY BE USED FOR 7 DAYS OR LESS. USE PERMANENTLY MOUNTED SIGNS FOR LONGER THAN 7 DAYS UNLESS USE OF PORTABLE SIGN SUPPORTS RECEIVES APPROVAL FROM THE REGION TRAFFIC ENGINEER.
6. USE A MINIMUM 7 FEET MOUNTING HEIGHT FROM ROADWAY SURFACE FOR SIGNS USING POST TYPES P1, P2 OR P3. REFER TO SN SERIES STANDARD DRAWINGS.
7. SIGN MAY BE USED ANYTIME IN WORK ZONE FOR SUPPLEMENTAL NOTIFICATION OF THE WORK ZONE SPEED LIMITS.
8. LOCATE A TEMPORARY EXIT SIGN IN THE TEMPORARY GORE. MOUNT THE TEMPORARY EXIT SIGN A MINIMUM OF 7 FEET FROM THE PAVEMENT SURFACE TO THE BOTTOM OF THE SIGN FOR BETTER VISIBILITY.

UTAH DEPARTMENT OF TRANSPORTATION

STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION

SALT LAKE CITY

RECOMMENDED FOR APPROVAL

CHAIRMAN STANDARDS COMMITTEE

APPROVED

DEPUTY DIRECTOR

FEB.23.2006

DATE

FEB.23.2006

DATE

WORK ZONE
SPECIALITY
SIGNS

STANDARD DRAWING TITLE

STD DWG
TC 3D

Standards Committee Submittal Sheet

Name of preparer: Robert Hull
Title/Position of preparer: Engineer for Traffic and Safety
Specification/Drawing/Item Title: Standard Specification 02891
Specification/Drawing Number: Traffic Signs

Enter appropriate priority level:

(See last page for explanation) 3

Sheet not required on editorial or minor changes to standards. Check with Standards Section.

NOTES:

1. All Submittal Sheets must be completed and sent to the Standards and Specifications Section by the Standards Committee suspense date as shown on the Web.
(<http://www.udot.utah.gov/index.php/m=c/tid=303>)
2. The Preparer of the Submittal Sheet or the Standards Committee member (or authorized substitute) responsible for the submittal must be present at the Standards Committee meeting and capable of discussing and answering all questions related to the submittal. The item will be postponed to a later meeting if one of these people is not present.
3. Notify the Standards and Specifications Section immediately of any changes that impact the presentation to include absence of sponsor or delay in presentation.

Complete the following: (Use additional pages as needed.)

- A. Why? Detail the reason for changing the Standard (Specification or Drawing), what has initiated a new Standard, or what has caused a new or changed item of interest.

The Division of Traffic and Safety, in cooperation with the Research Division, has under taken a review of the materials the Department is using for the manufacturing of highway traffic signs. The current Standard Specification is using beaded sheeting technology that is in the process of being phased out. At the time of adoption, the sheeting specification was considered to be the industry standard, but has essentially been unchanged for the last 16 years.

The review considered the following: Unit Price of the installed sign, Color Characteristics, Retroreflectivity, Adhesion to Substrate, and Safety.

Fifteen states are in support of making the change to the ASTM Type XI sheeting. They are in support of the Public Interest Findings for using a single sheeting, and believe that this sheeting is the appropriate material to be used on all traffic signs on their system. Six of these states (Arizona, Illinois, Iowa, Maryland, Minnesota, and Virginia) have already completed the change. Members of the AASHTO Subcommittee on Traffic Engineering are supportive of this direction on sign sheeting.

We are proposing to replace the current ASTM Type III sheeting in the Standard Specification with ASTM Type XI Sheeting.

- B. How is Measurement and Payment handled? Existing (from the measurement and payment document), modified, or new measurement and payment to be included with all Standard Specifications or Supplemental Specifications.

No Change

- C. Stakeholder Notification for AGC and ACEC:

By email provide the AGC and ACEC Standards Committee member a copy of all pertinent information relating to the specification or drawing. Detail all responses below. Indicate if no comments were received.

Note: There is a two-week response time set for this item.

Refer to the Standards Committee Web site, Members page at <http://www.udot.utah.gov/index.php/m=c/tid=659> for the respective e-mail addresses.

AGC Comments: (Use as much space as necessary.)

**No Comments
Attached in Comment Resolution document.**

ACEC Comments: (Use as much space as necessary.)

**No Comments
Attached in Comment Resolution document.**

- D. Stakeholders? From the list provided, document the stakeholders contacted, detailing: the company, name of contact, how contacted (by phone, email, hard copy, or in person), concerns, and comments of the change. Stakeholders:

Note: There is a two-week response time set for this item. Allow Stakeholders two weeks to process and respond to coordination requests. All areas should try to complete review and comment as soon as possible but within two weeks.

List of all individuals attached.

In-house (for example, preconstruction, materials, construction, safety, design, maintenance) (Include all applicable in-house areas even if not listed above.)

All Senior Project Managers, all Preconstruction Engineers, all Traffic Engineers, all Maintenance Engineers, all Region and District Directors, and all members of the Standards Committee.

Construction Engineers

All Construction Engineers and Central Construction

Contractors (Any additional contacts beyond “C” above.)

None

Suppliers

None

Consultants (as required) (Any additional contacts beyond “C” above.)

None

FHWA (To be accomplished as part of the two-week process before submitting to the Standards and Specifications Section for inclusion on the Standards Committee agenda.) (This is in addition to the requirements of UDOT Policy 08A5-1, procedure 08A5-1.3.)

Anthony Sarahan.

FHWA is being contacted on the Public Interest Finding (PIF)

Others (as appropriate)

None

E. Other impacted areas, systems, or personnel. (Consider all impacts and possible changes to these areas during the preparation process. Coordinate with all appropriate areas for the respective item. List all impacts and action taken.)

1. Minimum Sampling and Testing Guide (MS&T Guide)

N/A

2. Business Systems (Electronic Bid System, Project Development Business System, Electronic Program Management, Computer-Aided Drafting and Design, etc.)

N/A

3. Implementation Plan (Provide detailed instructions on how the subject item will be implemented to include notification of all interested parties and training requirements.)

All new projects will use the new specification.

F. Costs? (Estimates are acceptable.)

1. Additional costs to average bid item price.

Average Unit Bid Price for Traffic Signs (which includes sheeting, substrate, frame, and posts) will increase slightly

2. Operational (For example, maintenance, materials, equipment, labor, administrative, programming).

N/A

3. Life cycle cost.

Life Cycle costs will decrease more than the increase in the Average Unit Bid Price, resulting in a net savings.

G. Benefits? (Provide details that can be used to complete a Cost – Benefit Analysis.) (Estimates are acceptable.) (If no costs, what is the benefit of making this change?)

Figures are attached. Calculations include the price of the current Standard Specification ASTM Type III encapsulated lens sheeting, price of ASTM Type IX sheeting, and the price of ASTM Type XI sheeting were compared. Additional components include the duration of warranties, and the adhesion to substrate.

H. Safety Impacts?

Safety considerations include the greater target value providing earlier recognition of signing, greater time to assess legends and make complex decisions, longer sign life, higher retroreflectivity (with Federal minimum standards for retroreflectivity on the near horizon), and uniformity of color, contrast, and brightness.

I. History? Address issues relating to the current usage of the item and past reviews, approvals, and/or disapprovals.

Several of the colors that are currently specified in projects (fluorescent orange, strong yellow-green, and fluorescent yellow) are not even available under the existing ASTM Type III Standard Specification. For example, the Department has had to modify the Standard Specification to provide the minimum signing required for every school zone sign in the state.

This item has not been brought up for previous discussion.

Priority Explanation

Enter the appropriate priority in the box on the first page of the document.

- | | |
|------------|---|
| Priority 1 | Upon posting, this impacts all projects in construction and design with a Change Order, Addenda, and immediate change to projects being advertised. |
| Priority 2 | Upon posting, this impacts projects being advertised. |
| Priority 3 | Upon posting, the approved standard takes effect four weeks later for projects being advertised. |

Standard Drawing/Specification Review Sheet		Review Comments		
STD DWG/Spec Number	02891, Traffic Signs	Sheet 1	of	2
Date:	April 9, 2007	Facilitator:	John Leonard	

Review Comments Form

Item No.	Reviewer	Sheet/Section No.	Comment	Review Mtg. Action	Final Action.
1	Bill Lawrence, R-2 Preconst.		I don't have an issue with the changes.	A	A
			Your picture label description in the e-mail is incorrect though. The XI is left, the III is on the right, in the first four pictures. If its not, then I do have an issue with the switch, because the XI would be far less visible, which I don't believe is the case.	A	A
			Response: The pictures were labeled incorrectly in the initial email. Captions corrected.		
2	Joe Kammerer, R-2 PM		John, should we expect a significant increase in cost as a result of these changes. Thanks Joe	B	A
			Response : There may be a slight 2-3% increase in the initial cost, but the life cycle costs will be ultimately be less because of the additional durability. Cost figures were provided to Joe.		
3	Joe Kammerer, R-2 PM	Followup	Good info thank you	A	A
			Response :		
4	L. Scott Nussbaum, R-1 Assistant District Engineer		Looks fine to me	A	A
			Response :		
5	Doug Bassett, R-3 Traffic		Maybe I am confused, but it looks to me like the Type XI is not as reflective as the current standard Type III in the pictures. Why would we want to put something out in the field that appears to have significant less reflectivity than what we already have? I think we need to have sign sheeting that is as reflective as we can afford without compromising night visibility, especially because of older drivers.	A	A
			Response : The pictures were labeled incorrectly in the initial email. Captions corrected.		
6	Hugh Kirkam, Price District		On the Sign Sheeting Field Examples it would read easier if your title read: ASTM Type III Encapsulated Lens left (current standard), ASTM Type IX middle, ASTM Type XI right That way the title follows the order of the sign faces.	A	A
			Response : The pictures were labeled incorrectly in the initial email. Captions corrected.		
7	Robert		Looks good to me, no comments.	A	A

Action Code	A	B	C	D
	Submitter will Comply	Submitter to Evaluate	Delete Comment	Others to Evaluate

Standard Drawing/Specification Review Sheet		Review Comments		
STD DWG/Spec Number	02891, Traffic Signs	Sheet 2	of	2
Date:	April 9, 2007	Facilitator:	John Leonard	

Item No.	Reviewer	Sheet/Section No.	Comment	Review Mtg. Action	Final Action.
	Miles, Preconst Eng.		Response :		
8	Anne Odgen, R-4 Traffic		<p>1.4 -- A more logical order would be to list <i>Substrate</i> then <i>Sheeting</i> then <i>Panel</i>...i.e. switch paragraphs B & C.</p> <p>1.4 -- <i>Frame</i> isn't defined anywhere. Should it be?</p> <p>1.4.B.1.b -- Use <i>P</i> for the type (instead of <i>PW</i>) for consistency with bid item names in PDBS.</p> <p>1.4.B.2 -- Insert colons after 1 & 2 to separate the numbers from their descriptions.</p> <p>1.4.D, F, & G -- maybe say <i>panel(s)</i> since it often is more than one panel per sign</p> <p>2.1.A -- <i>sign(s)</i> and <i>post(s)</i> ?</p> <p>2.1.D.3.a -- need a space between <i>1011</i> and <i>Grade</i></p> <p>3.2.E -- ...orientation of all signs <i>and</i> structures and determine proper...</p> <p>3.2.F -- "Maintain covering" until covering is removed or until sign is removed? Or both? Not very specific...</p> <p>3.2.G -- <i>sign post</i> should be two words</p>	<p>A</p> <p>B</p> <p>A</p> <p>A</p> <p>B</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p>	<p>A</p> <p>B</p> <p>A</p> <p>A</p> <p>B</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p>
9	Bret Sorenson, R-4 Design		<p>Attached are some comments and suggestions our designers have put together regarding Spec 02891</p> <p>Response: Editorial changes made. Comments that referred to sign posts, sign components, and designation of P-5 sign will be addressed in the SN Standard Drawing Review.</p>	B	A, B
10	Tyler Yorgason, ACEC		<p>Again, I apologize for the delay in getting this to you, but I received no comments from ACEC regarding the proposed revisions to Standard Specification 02891, Traffic Signs. Thanks for the chance for ACEC to comment on the changes.</p> <p>Response</p>	A	A
11	Mont Wilson, AGC		<p>Called when no written response. Mont returned call and indicated that he saw no issues that would affect the AGC members at this time.</p> <p>Response</p>	A	A
12	Karl Verhaeren, Central Construction		<p>Delete Part 3, Article 2, Paragraph A "Furnish a daily record of the number and location of all traffic control devices in use."</p> <p>Response: Deleted. Remaining paragraphs renumbered</p>	A	A

Action Code	A	B	C	D
	Submitter will Comply	Submitter to Evaluate	Delete Comment	Others to Evaluate



ASTM Type XI left, ASTM Type IX middle, ASTM Type III Encapsulated Lens right (current Standard)



ASTM Type XI left, ASTM Type IX middle, ASTM Type III Encapsulated Lens right (current Standard)



ASTM Type XI left, ASTM Type IX middle, ASTM Type III Encapsulated Lens right (current Standard)



ASTM Type XI left, ASTM Type IX middle, ASTM Type III Encapsulated Lens right (current Standard)



ASTM Type III High Intensity Prismatic (HIP) left, ASTM Type XI right



ASTM Type III Encapsulated Lens left (current Standard), ASTM Type XI right (Both Signs)



ASTM Type III Encapsulated Lens left (current Standard), ASTM Type XI right



ASTM Type III Encapsulated Lens left (current Standard), ASTM Type XI right

Type III High Intensity Encapsulated Lens (Current Spec) v Type XI

Warranty Period for Total Replacement, Type III Encapsulated Lens	8					
Warranty Period for Total Replacement, Proposed Type XI	10					
Sign Type		P1	P2	A1	A2	AUX
Existing Unit Price of Sign Installed, Per Square Foot		\$32.71	\$53.47	\$44.42	\$39.26	\$49.87
Current Sheeting Cost Per Square Foot	\$2.94					
Proposed Sheeting Cost Per Square Foot	\$3.90					
Proposed Unit Price of Sign Installed, Per Square Foot		\$33.67	\$54.43	\$45.38	\$40.22	\$50.83
Change In Cost (%)		2.93%	1.80%	2.16%	2.44%	1.93%
Future Cost in Year Original Sign Replacement Warranty Expires (7% Inflation)		\$56.21	\$91.87	\$76.33	\$67.46	\$85.68
Additional Cost When Original Sign Replaced (Replacement Warranty Year)		\$14.05	\$22.97	\$19.08	\$16.87	\$21.42
Total Unit Cost Using Existing Sheeting (including partial replacement period)		\$46.77	\$76.43	\$63.51	\$56.13	\$71.28
Change In Unit Cost (over life of proposed sheeting)		-27.99%	-28.79%	-28.54%	-28.34%	-28.70%

Type IX (VIP)* Standard Colors v Type XI

Warranty Period for Total Replacement, Type IX (VIP)	10					
Warranty Period for Total Replacement, Proposed Type XI	10					
Sign Type		P1	P2	A1	A2	AUX
Existing Unit Price of Sign Installed, Per Square Foot		\$32.71	\$53.47	\$44.42	\$39.26	\$49.87
Current Type IX Sheeting Cost Per Square Foot	\$4.42					
Adjusted Unit Price (Differential between Type III and Type IX), Per Square Foot		\$34.19	\$54.95	\$45.90	\$40.74	\$51.35
Proposed Sheeting Cost Per Square Foot	\$3.90					
Proposed Unit Price of Sign Installed, Per Square Foot		\$33.67	\$54.43	\$45.38	\$40.22	\$50.83
Change In Unit Cost (over life of proposed sheeting)		-1.52%	-0.95%	-1.13%	-1.28%	-1.01%

*--Type XI will replace Type IX

Type IX (VIP)* Fluorescent Yellow-Green v Type XI

Warranty Period for Total Replacement, Type IX (VIP)	10					
Warranty Period for Total Replacement, Proposed Type XI	10					
Sign Type		P1	P2	A1	A2	AUX
Existing Unit Price of Sign Installed, Per Square Foot		\$32.71	\$53.47	\$44.42	\$39.26	\$49.87
Current Type IX Sheeting (Fluorescent) Cost Per Square Foot	\$5.10					
Adjusted Unit Price (Differential between Type III and Type XI), Per Square Foot		\$34.87	\$55.63	\$46.58	\$41.42	\$52.03
Proposed Sheeting Cost Per Square Foot	\$3.90					
Proposed Unit Price of Sign Installed, Per Square Foot		\$33.67	\$54.43	\$45.38	\$40.22	\$50.83
Change In Unit Cost (over life of proposed sheeting)		-3.44%	-2.16%	-2.58%	-2.90%	-2.31%

*--Type XI will replace Type IX

Mail Envelope Properties (46036B5F.6A0 : 156 : 17220)

Subject: Proposed Revisions to Standard Specification 02891, Traffic Signs
Creation Date Thursday, March 22, 2007 11:53 PM
From: John Leonard

Created By: jleonard@utah.gov

Recipients	Action	Date & Time
civilscience.com tyorgason (Tyler Yorgason)	Transferred	03/22/07 11:54 PM
dot.gov Roland.Stanger CC (Roland Stanger)	Transferred	03/22/07 11:54 PM
dot.gov sarhan anthony	Transferred	03/22/07 11:54 PM
gcinc.com mont.wilson (Mont Wilson)	Transferred	03/22/07 11:54 PM
utah.gov SRCOPO1.SRDOMAIN	Delivered	03/22/07 11:53 PM
BAXELROD CC (Barry Axelrod)	Opened	03/23/07 8:47 AM
	Opened	03/28/07 10:04 AM
BWHEELER (Boyd Wheeler)	Opened	03/23/07 8:34 AM
GSCHULTE (Glenn Schulte)	Opened	03/26/07 7:13 AM
JLEONARD (John Leonard)	Opened	03/22/07 11:54 PM
	Forwarded	03/26/07 3:08 PM
LMONTOYA (Larry Montoya)	Opened	03/23/07 8:07 AM
LYNNBERNHARD CC (Lynn Bernhard)	Opened	03/26/07 1:23 PM
MDONIVAN (Mike Donovan)	Opened	03/26/07 7:04 AM
	Deleted	03/26/07 7:16 AM
	Emptied	04/03/07 1:14 AM
PNEGUS (Peter Negus)		
RHULL (Robert Hull)	Opened	03/23/07 11:22 AM
RICHARDCLARKE (Richard Clarke)	Opened	03/23/07 8:12 AM
RLINDSEY (Rukhsana Lindsey)	Opened	03/26/07 9:28 AM
	Downloaded	03/30/07 3:10 PM
ROBERTMILES CC (Robert Miles)	Opened	03/23/07 12:28 PM
	Deleted	04/02/07 9:28 AM
	Replied	04/02/07 9:28 AM
	Emptied	04/10/07 1:15 AM
SBURNS (Stan Burns)	Opened	03/23/07 11:38 AM

	Forwarded	03/26/07 7:53 AM
	Deleted	03/26/07 7:53 AM
STANADAMS (Stan Adams)	Opened	03/25/07 12:26 AM
TBIEL (Tim Biel)	Opened	03/26/07 2:02 PM
	Deleted	03/26/07 2:02 PM
	Emptied	04/03/07 1:16 AM
WSJONES (W. Scott Jones)	Opened	03/23/07 11:55 AM
	Deleted	03/23/07 4:15 PM
	Emptied	03/30/07 1:21 AM
utah.gov		
SRR1PO1.SRDOMAIN	Delivered	03/22/07 11:53 PM
CJACOBSON (Carrie Jacobson)	Opened	03/23/07 9:09 AM
CORYPOPE CC (Cory Pope)	Opened	03/23/07 5:39 AM
	Deleted	03/23/07 7:47 AM
	Emptied	03/31/07 1:05 AM
DDUERSCH (Darin Duersch)		
DENNISSIMPER (Dennis Simper)	Opened	03/23/07 9:16 AM
GLENAMES (Glen Ames)	Deleted	03/22/07 11:57 PM
	Emptied	04/01/07 9:37 PM
KGRIFFIN (Kevin Griffin)	Opened	03/26/07 10:13 AM
NATEPETERSON (Nathan Peterson)	Opened	03/26/07 7:43 AM
NLEE (Nathan Lee)	Deleted	03/23/07 7:54 AM
	Emptied	03/29/07 8:38 AM
REXHARRIS (Rex Harris)		
SNUSSBAUM (Scott Nussbaum)	Opened	03/23/07 4:07 PM
	Replied	03/27/07 12:17 PM
	Deleted	03/27/07 12:17 PM
	Emptied	03/27/07 12:34 PM
utah.gov		
SRR2PO1.SRDOMAIN	Delivered	03/22/07 11:53 PM
BILLLAWRENCE (Bill Lawrence)	Opened	03/23/07 6:07 AM
	Replied	03/26/07 2:33 PM
	Deleted	03/26/07 2:33 PM
	Emptied	04/10/07 1:03 AM
BPURDIE (Betty Purdie)	Opened	03/23/07 7:05 AM
	Forwarded	04/03/07 1:08 PM
JASONDAVIS CC (Jason Davis)	Opened	03/28/07 7:29 AM
	Deleted	03/28/07 7:29 AM
	Emptied	03/30/07 2:10 PM
JKAMMERER (Joe Kammerer)	Opened	03/23/07 8:53 AM
	Replied	03/23/07 8:55 AM
	Deleted	03/23/07 8:55 AM
	Emptied	03/31/07 1:04 AM
KRISPETERSON (Kris Peterson)	Opened	03/23/07 8:46 AM

RPARK (Randy Park)	Deleted	03/23/07 4:13 PM
	Emptied	03/31/07 1:06 AM
RWIGHT (Rob Wight)	Opened	03/23/07 7:20 AM
utah.gov		
SRR3PO1.SRDOMAIN	Delivered	03/22/07 11:53 PM
BSCHVANEVELDT (Brent Schvaneveldt)	Opened	03/26/07 6:22 AM
	Forwarded	03/26/07 6:24 AM
	Deleted	03/27/07 8:04 AM
	Emptied	03/27/07 8:04 AM
DBASSETT (Doug Bassett)	Opened	03/27/07 2:35 PM
	Replied	03/27/07 3:42 PM
	Deleted	03/27/07 3:44 PM
	Emptied	03/27/07 3:45 PM
DNAZARE CC (David Nazare)	Opened	03/23/07 10:21 AM
	Deleted	03/26/07 8:44 AM
	Emptied	04/03/07 1:02 AM
MERRELLJOLLEY (Merrell Jolley)	Opened	03/23/07 3:06 PM
RMARKLE (Robert Markle)	Opened	03/23/07 7:05 AM
	Deleted	04/03/07 4:33 PM
RWESTOVER (Robert Westover)	Opened	03/23/07 7:28 AM
	Deleted	03/23/07 7:28 AM
SCOTTANDRUS (Scott Andrus)	Opened	03/24/07 9:34 AM
	Deleted	03/26/07 8:44 AM
	Emptied	03/26/07 8:44 AM
utah.gov		
SRR4PO1.SRDOMAIN	Delivered	03/22/07 11:53 PM
ANNEOGDEN (Anne Ogden)	Opened	03/26/07 7:50 AM
	Replied	04/05/07 4:39 PM
BSORENSEN (Bret Sorenson)	Opened	04/05/07 4:51 PM
	Replied	04/05/07 5:05 PM
	Emptied	04/05/07 5:10 PM
CLARKMACKAY (Clark Mackay)	Opened	03/26/07 8:46 AM
DHAWKS CC (Dal Hawks)	Opened	03/23/07 10:25 AM
HKIRKHAM (Hugh Kirkham)	Opened	03/23/07 9:41 AM
	Replied	03/30/07 1:07 PM
KVERHAEREN (Karl Verhaeren)	Opened	03/23/07 6:49 AM
	Forwarded	03/23/07 11:55 AM
	Deleted	03/27/07 10:07 AM
	Undeleted	03/27/07 10:07 AM
MILES (Mike Miles)	Opened	03/23/07 6:23 AM
	Forwarded	03/23/07 6:24 AM
NMERRILL (Nathan Merrill)	Opened	03/23/07 8:21 AM
	Downloaded	04/10/07 10:34 AM
RDOWELL (Robert Dowell)	Opened	03/23/07 9:25 AM

RTORGERSON (Rick Torgerson)	Opened	03/23/07 7:14 AM
	Deleted	03/23/07 7:15 AM
	Emptied	03/23/07 7:15 AM
SCOTTMUNSON (Scott Munson)	Opened	03/26/07 9:52 AM
SOGDEN (Steve Ogden)		
TTORGERSEN (Troy Torgersen)	Opened	03/26/07 7:26 AM
utah.gov		
SRTCPO1.SRDOMAIN	Delivered	03/22/07 11:53 PM
DANIELLEHERRSCHER (Danielle Herrscher)	Opened	03/23/07 7:29 AM
DKINNECOM (Dave Kinnecom)	Opened	03/26/07 11:40 AM
EBRONDUM (Erik Brondum)	Opened	03/25/07 11:23 AM
ROBERTCLAYTON (Rob Clayton)	Opened	03/23/07 8:49 AM
TLPETERSON (Troy Peterson)	Opened	03/26/07 9:15 AM

Post Office**Delivered****Route**

sarhan

civilscience.com
dot.gov
dot.gov
gcinc.com

SRCOPO1.SRDOMAIN	03/22/07 11:53 PM	utah.gov
SRR1PO1.SRDOMAIN	03/22/07 11:53 PM	utah.gov
SRR2PO1.SRDOMAIN	03/22/07 11:53 PM	utah.gov
SRR3PO1.SRDOMAIN	03/22/07 11:53 PM	utah.gov
SRR4PO1.SRDOMAIN	03/22/07 11:53 PM	utah.gov
SRTCPO1.SRDOMAIN	03/22/07 11:53 PM	utah.gov

Files**Size****Date & Time**

MESSAGE	834	Thursday, March 22, 2007 11:53 PM
02891-Traffic Signs proposed changes 3-22-07.pdf	18202	Thursday, March 22, 2007 11:53 PM
Section 02891 Traffic Signs Submittal Sheet 3-22-07.pdf		18911 Thursday, March 22, 2007 11:53 PM
Sign Sheeting Specification Analysis 3-22-07.pdf	9926	Thursday, March 22, 2007 11:53 PM
Sign Sheeting Field Examples.pdf	651082	Thursday, March 22, 2007 11:53 PM

Options

Auto Delete:	No
Expiration Date:	None
Notify Recipients:	Yes
Priority:	Standard
ReplyRequested:	No
Return Notification:	
Send Notification when Opened	

Send Notification when Deleted
Send Mail Receipt when Undeliverable

Concealed Subject:	No
Security:	Standard
To Be Delivered:	Immediate
Status Tracking:	All Information

**Supplemental Specification
2005 Standard Specification Book**

SECTION 02891

TRAFFIC SIGNS

Delete Section 02891 in its entirety and replace with the following:

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Materials and procedures for installing traffic signs.

1.2 RELATED SECTIONS

- A. Section 02317: Structural Excavation
- B. Section 03055: Portland Cement Concrete
- C. Section 03211: Reinforcing Steel and Welded Wire
- D. Section 05120: Structural Steel
- E. Section 06055: Timber and Timber Treatment

1.3 REFERENCES

- A. ASTM A 153: Zinc Coating (Hot-Dip) on Iron and Steel Hardware
- B. ASTM A 314: Stainless Steel Billets and Bars for Forging
- C. ASTM A 500: Cold-Formed Welded and Seamless Carbon Steel Structural
Tubing in Rounds and Shapes
- D. ASTM A 513: Electric-Resistance-Welded Carbon and Alloy Steel Mechanical
Tubing
- E. ASTM A 653: Steel, Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated
(Galvannealed) by Hot-Dip Process

F. ASTM A 1011: Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability

G. ASTM B 209: Aluminum and Aluminum-Alloy Sheet and Plate

H. ~~APA:~~American Plywood Association (APA) Product Standard

I. Code of Federal Regulations

~~I. Military Specification MIL-M-4371B~~

1.4 TRAFFIC SIGN COMPONENTS

~~A.A.~~ Substrate: The base material, usually plywood or aluminum, upon which the background sheeting is attached.

B. Sheeting: The reflective or non-reflective material that comprises the background legend, border, and symbols.

BC. Panel: Assembly of substrate and attached sheeting. Several panels may be necessary to complete one sign. Panel types are:

1. Type
 - a. A: Reflective sheeting on sheet aluminum.
 - b. ~~PW~~: Reflective sheeting on plywood.
2. Legend:
 - a. 1. With non-reflective legend, symbols, and borders.
 - b. 2. With reflective legend, symbols, and borders.

~~C. Sheeting: The reflective or non-reflective material that comprises the background legend, border, and symbols.~~

D. Sign: A complete assembly comprised of post, frame, and panel.

E. Auxiliary Sign: A sign including frame, if required, attached and supplemental to a complete sign assembly.

F. Panel replacement: Removing the existing panel and attaching a new panel to the frame.

G. Panel Overlay: Attaching new panels to all or part of an existing panel.

H. Size: Horizontal x vertical

1.5 SIGN CODES

- A. New Sign: N
- B. Auxiliary Sign: Aux
- C. Relocation: R
- D. Removal: X
- E. Panel Replacement: PR
- F. Panel Overlay: PO

1.6 SUBMITTALS

- A. Submit three sets of drawings for overhead structures for prefabrication approval. Allow 14 calendar days for approval.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Fabricate sign(s) and post(s) as specified per SN series Standard Drawings.
- B. Substrate: 0.080 inch thick. ASTM B 209 alloy 6061-T6, or 5052-H38.
- C. Plywood as specified below and which meets the American Plywood Association product standard 1 PSI-83, Group 1, 5/8 inch thick.
 - 1. 90/90, high density BB exterior (Douglas Fir) B Grade.
 - 2. Plugged-core (Douglas Fir) with 1/2 inch maximum gaps.
 - 3. Use acrylic laminate that is compatible with the reflective sheeting adhesive, and that does not require the removal of the release agents before applying the sheeting.
- D. Posts:
 - 1. Timber Sign Post (P1)
 - a. Follow Section 06055
 - 2. Tubular Steel Sign Post (P2)
 - a. Post: ASTM A 513
 - b. Finish: Galvanize ASTM A 653

- c. Shape: As shown, wall thickness 0.080
 - d. Color: Powder coated as required
 - 3. Square Steel Sign Post (P3)
 - a. Post: ASTM A 1011 Grade 50
 - b. Finish: Galvanize ASTM A 653
 - c. Shape: 12 gauge or 10 gauge steel
 - d. Color: Powder coated as required
 - 4. Slip Base Tubular Steel Sign Post (P4)
 - a. Post ASTM A 500 Grade C; 46,000 psi minimum yield
 - b. Finish: Galvanize ASTM A 153
 - c. Shape: As shown; schedule 80
 - d. Color: Powder coated as required
 - 5. Steel Sign Post (P5)
 - a. Follow Section 05120
- E. Reflective Sheeting:
 - ~~1. Encapsulated lens sheeting or encapsulated lens (flexible) as specified.~~
 - 21. Meet Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects FP-9203, Type III.
 - 2. Conform to 23CFR655 Subpart F for Standard Highway colors for Ordinary and Fluorescent Sheeting.
 - 3. Meet the requirements of ASTM Type XI.
- F. Nonreflective Sheeting: As specified. ~~Meet Military Specification MIL-M 4371B, Type I, Class I, and in accordance with the recommendation of the reflective sheeting manufacturer.~~
- G. Fasteners: As specified. Meet ASTM A 314, Class 304, 18-8, Stainless Steel.
- H. Foundation
 - 1. Concrete: Class A (AE). Refer to Section 03055.
 - 2. Reinforcing steel: Refer to Section 03211.
 - 3. Anchor bolts: Refer to Section 05120.
- I. Structural Steel: Structural Steel frame. Refer to Section 05120.
- J. Temporary covering: Opaque material.

PART 3 EXECUTION

3.1 PREPARATION

- A. Coordinate utility location.
- B. Excavate following Section 02317 requirements.
- C. Install traffic control devices before work activities begin.

3.2 INSTALLATION - GENERAL

~~A. Furnish a daily record of the number and location of all traffic control devices in use.~~

~~B.~~ Do not reverse screen sign larger than 7 square feet per color.

~~C.~~ Do not remove a sign that is being replaced until the new sign is placed and uncovered.

~~D.~~ Compact backfill to a density equal to surrounding materials.

~~E.~~ Establish proper elevation and orientation of all signs, and structures, and determine proper sign post lengths as dictated by construction slopes.

~~F.~~ Cover signs that require temporary covering with an opaque material. Secure at the rear of the sign so that the sign is not damaged. Maintain covering until covering or sign is removed.

~~G.~~ Construct sign post foundations with concrete conforming to indicated dimensions.

3.3 RELOCATING EXISTING SIGN

- A. Retrofit as required to meet current standards.
- B. Provide new posts and accessories as required.
- C. Remove foundations to a minimum of 6 inches below the ground line, and backfill.

3.4 REMOVING EXISTING SIGN

- A. Remove foundations to a minimum of 6 inches below the ground line and backfill.

END OF SECTION

Standards Committee Submittal Sheet

Name of preparer: John Leonard
Title/Position of preparer: Traffic and Safety Operations Engineer
Specification/Drawing/Item Title: 2 Lane Road Intersection
Specification/Drawing Number: DD 14A, DD 14B, DD 15A1, DD 15A2, DD 15B

Enter appropriate priority level:

(See last page for explanation) 3

Sheet not required on editorial or minor changes to standards. Check with Standards Section.

NOTES:

1. All Submittal Sheets must be completed and sent to the Standards and Specifications Section by the Standards Committee suspense date as shown on the Web.
(<http://www.udot.utah.gov/index.php/m=c/tid=303>)
2. The Preparer of the Submittal Sheet or the Standards Committee member (or authorized substitute) responsible for the submittal must be present at the Standards Committee meeting and capable of discussing and answering all questions related to the submittal. The item will be postponed to a later meeting if one of these people is not present.
3. Notify the Standards and Specifications Section immediately of any changes that impact the presentation to include absence of sponsor or delay in presentation.

Complete the following: (Use additional pages as needed.)

- A. Why? Detail the reason for changing the Standard (Specification or Drawing), what has initiated a new Standard, or what has caused a new or changed item of interest.

The Standards Committee requested Traffic and Safety to review the existing 'Tee' intersection design for 2 lane roads, and create new drawings for a cross intersection for 2 lane roads.

Specifically, the existing DD 14 was broken into two drawings, DD 14A and DD 14B, with one for high speed and one for low speed application. New drawings were created for the cross intersection, one for high speed, one for high speed with an acceleration lane, and one for low speed applications. These new drawings are DD 15A1, DD 15A2, and DD 15B.

The existing DD 14 was not fully compliant with either the Green Book or the MUTCD. Changes were incorporated to meet these requirements.

- B. How is Measurement and Payment handled? Existing (from the measurement and payment document), modified, or new measurement and payment to be included with all Standard Specifications or Supplemental Specifications.

Existing

C. Stakeholder Notification for AGC and ACEC:

By email provide the AGC and ACEC Standards Committee member a copy of all pertinent information relating to the specification or drawing. Detail all responses below. Indicate if no comments were received.

Note: There is a two-week response time set for this item.

Refer to the Standards Committee Web site, Members page at <http://www.udot.utah.gov/index.php/m=c/tid=659> for the respective e-mail addresses.

AGC Comments: (Use as much space as necessary.)

**No Comments
Attached in Comment Resolution document.**

ACEC Comments: (Use as much space as necessary.)

**No Comments
Attached in Comment Resolution document.**

D. Stakeholders? From the list provided, document the stakeholders contacted, detailing: the company, name of contact, how contacted (by phone, email, hard copy, or in person), concerns, and comments of the change. Stakeholders:

Note: There is a two-week response time set for this item. Allow Stakeholders two weeks to process and respond to coordination requests. All areas should try to complete review and comment as soon as possible but within two weeks.

List of all individuals below

In-house (for example, preconstruction, materials, construction, safety, design, maintenance) (Include all applicable in-house areas even if not listed above.)

Robert Dowell, Kevin Griffin, Rex Harris, Ben Huot, Randy Jefferies, Fred Jenkins, Bill Lawrence, Jim McConnell, Nathan Merrill, Mike Miles, Scott Munson, Steve Odgen, Betty Purdie, Brent Schvaneveldt, Dennis Simper, Karl Verhaeren, Robert Wextover, and Rob Wight.

Construction Engineers

In above list

Contractors (Any additional contacts beyond “C” above.)

None

Suppliers

None

Consultants (as required) (Any additional contacts beyond “C” above.)

None

FHWA (To be accomplished as part of the two-week process before submitting to the Standards and Specifications Section for inclusion on the Standards Committee agenda.)
(This is in addition to the requirements of UDOT Policy 08A5-1, procedure 08A5-1.3.)

Carlos Machado. Roland Stanger has been a partner throughout the review process.

Others (as appropriate)

None

E. Other impacted areas, systems, or personnel. (Consider all impacts and possible changes to these areas during the preparation process. Coordinate with all appropriate areas for the respective item. List all impacts and action taken.)

1. Minimum Sampling and Testing Guide (MS&T Guide)

None

2. Business Systems (Electronic Bid System, Project Development Business System, Electronic Program Management, Computer-Aided Drafting and Design, etc.)

None

3. Implementation Plan (Provide detailed instructions on how the subject item will be implemented to include notification of all interested parties and training requirements.)

None

F. Costs? (Estimates are acceptable.)

1. Additional costs to average bid item price.

None

2. Operational (For example, maintenance, materials, equipment, labor, administrative, programming).

None

3. Life cycle cost.

None

G. Benefits? (Provide details that can be used to complete a Cost – Benefit Analysis.) (Estimates are acceptable.) (If no costs, what is the benefit of making this change?)

Safer operating practices and compliance with the MUTCD.

H. Safety Impacts?

Safer operating practices and compliance with the MUTCD.

I. History? Address issues relating to the current usage of the item and past reviews, approvals, and/or disapprovals.

There have been a lot of questions about other situations that were not covered in the original DD 14. Traffic and Safety was request to clarify and provide additional guidance for the widening at 2 lane road intersections.

Priority Explanation

Enter the appropriate priority in the box on the first page of the document.

Priority 1 Upon posting, this impacts all projects in construction and design with a Change Order, Addenda, and immediate change to projects being advertised.

Priority 2 Upon posting, this impacts projects being advertised.

Priority 3 Upon posting, the approved standard takes effect **four weeks** later for projects being advertised.

Standard Drawing/Specification Review Sheet		Review Comments		
Std Dwg/Spec Number	DD 14A, B; DD 15 A, A1, B	Sheet 1	of	1
Date:	APRIL 9, 2007	Facilitator:	John Leonard	

Review Comments Form

Item No.	Reviewer	Sheet/Section No.	Comment	Review Mtg. Action	Final Action.
1	Steve Odgen, R-4 Design	DD 14A	"See Note 6" is pointing to the right turn/deceleration lane. Has this note been placed here inadvertently?	B	C
			Response: Note 6 is there to provide guidance for acceptance width when a right turn acceleration lane is not used.		
2	Steve Odgen, R-4 Design	All Sheets	Where can I find reference to the use of "L" for taper lengths? I have driven several intersections with the taper length of "L/2" and they seem to drive just fine.	B	A
			Response: The use of L/2 is for temporary conditions, as outlined in Part 6, Temporary Traffic Control of the MUTCD. The requirement for using L is in Part 3, Markings. This concept has been reviewed and endorsed by the Department's Traffic Engineering Panel		
3	Steve Odgen, R-4 Design	All Sheets	In most cases there is typically an intersection in place before the turn lanes are required. When the turn lanes become required, the existing pavement is widened. Has the addition of a small strip of pavement to widen out the right turn receiving lane to 16' on mainline, been practiced by anyone yet? Seems like it might be a lot of work for little gain, unless there is a high number of trucks making this movement.	B	C
			Response: Depending on the situation, widening is often carried out split on both sides, or 6' each way. If the widening is necessary to go out to 16', that would increase the required widening by 4', not require a sliver patch. Each location will have to be reviewed, and adjustments made accordingly.		
4	Ben Huot, R-2 Design	All Sheets	I've attached the standard drawings with comments. I used the commenting tools in acrobat so hopefully they show up correctly. Let me know if you have any questions.	A	A
			Response: Multiple editorial changes made		
5	Clark Mackay, R-4	All Sheets	First sheet of sub-series is the #, not the #A	B	C
			Response: When there are more than one sheet in a sub-series (I.E., DD 14A, DD 14B, etc), the first sheet has the 'A' suffix.		
6	Clark Mackay, R-4	All Sheets	Multiple editorial comments made on hard copy.	A	A
			Response: Multiple editorial changes made		
7					
			Response:		

Action Code	A	B	C	D
	Submitter will Comply	Submitter to Evaluate	Delete Comment	Others to Evaluate

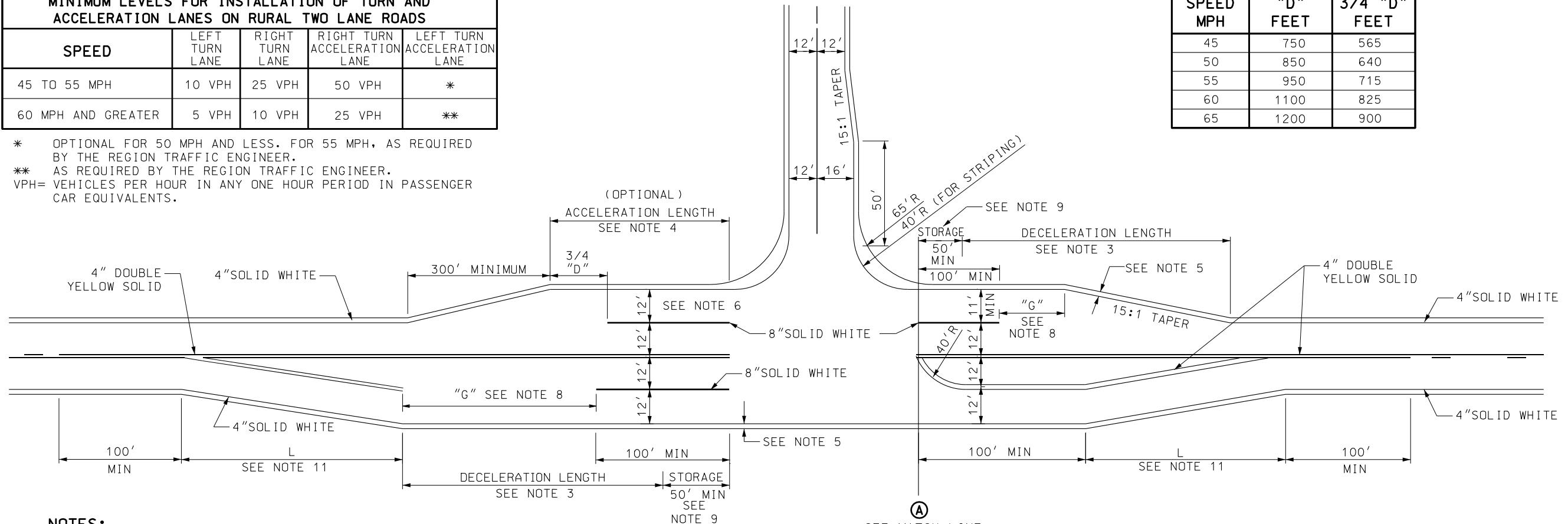
TABLE I				
MINIMUM LEVELS FOR INSTALLATION OF TURN AND ACCELERATION LANES ON RURAL TWO LANE ROADS				
SPEED	LEFT TURN LANE	RIGHT TURN LANE	RIGHT TURN ACCELERATION LANE	LEFT TURN ACCELERATION LANE
45 TO 55 MPH	10 VPH	25 VPH	50 VPH	*
60 MPH AND GREATER	5 VPH	10 VPH	25 VPH	**

* OPTIONAL FOR 50 MPH AND LESS. FOR 55 MPH, AS REQUIRED BY THE REGION TRAFFIC ENGINEER.

** AS REQUIRED BY THE REGION TRAFFIC ENGINEER.

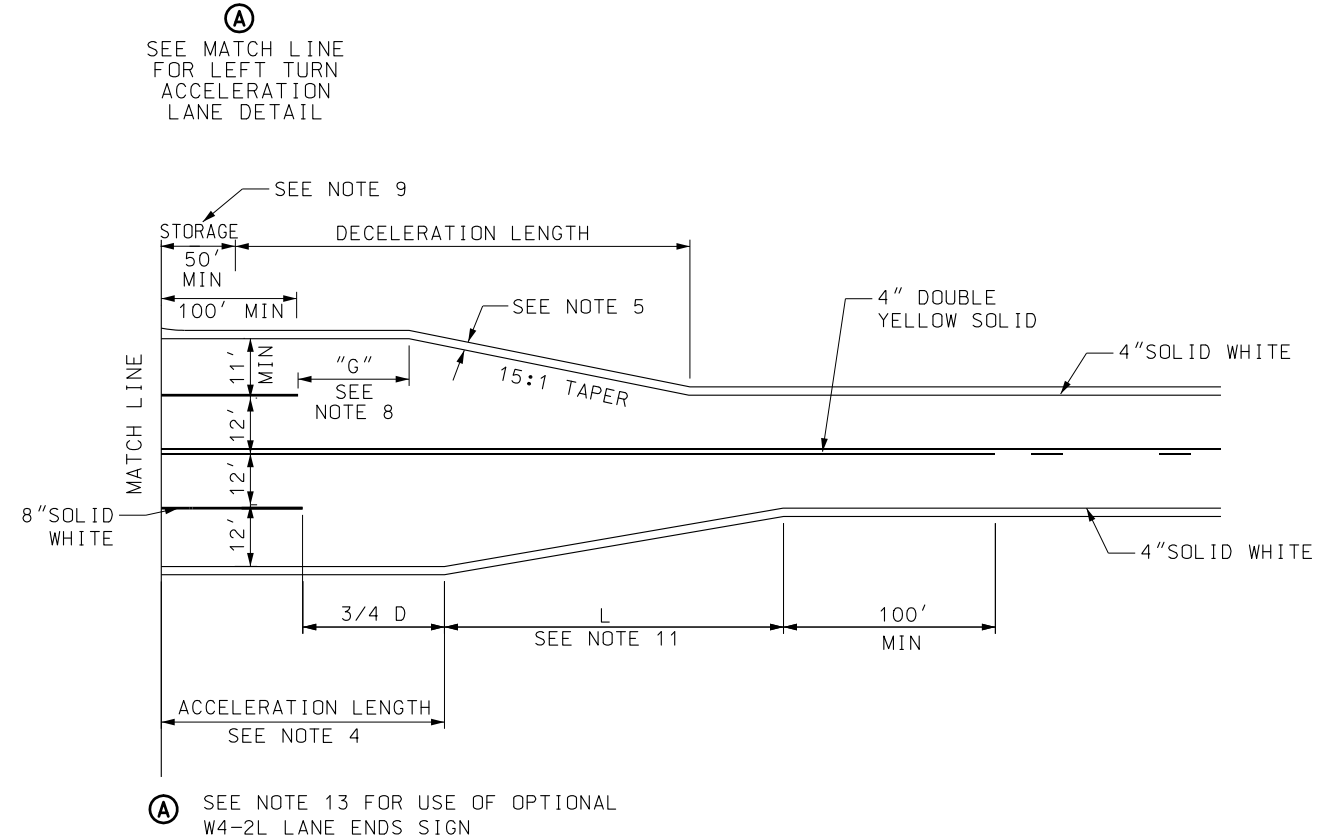
VPH= VEHICLES PER HOUR IN ANY ONE HOUR PERIOD IN PASSENGER CAR EQUIVALENTS.

"D" DISTANCE		
SPEED MPH	"D" FEET	3/4 "D" FEET
45	750	565
50	850	640
55	950	715
60	1100	825
65	1200	900



NOTES:

1. USE CURRENT EDITION OF THE AASHTO A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS FOR DESIGN OF ROADWAY ELEMENTS NOT SHOWN ON THIS STD DWG.
2. USE CURRENT EDITION OF THE AASHTO ROADSIDE DESIGN GUIDE FOR CLEAR ZONE REQUIREMENTS NOT SHOWN ON THIS STD DWG.
3. FOR DECELERATION LENGTH:
RIGHT TURN - USE THE POSTED SPEED LIMIT AS THE DESIGN SPEED AND AN AVERAGE RUNNING SPEED OF 14 MPH.
LEFT TURN - USE THE POSTED SPEED LIMIT AS THE DESIGN SPEED AND AN AVERAGE RUNNING SPEED OF A STOP CONDITION.
ADJUST FOR SPEED CHANGES ON GRADES AS NECESSARY.
4. FOR ACCELERATION LENGTH:
USE AN INITIAL RUNNING SPEED OF 14 MPH AND USE THE POSTED SPEED LIMIT AS THE DESIGN SPEED.
ADJUST FOR SPEED CHANGES ON GRADES AS NECESSARY.
5. USE 4 FEET MINIMUM SHOULDER FOR RIGHT TURN DECELERATION LANE TAPER, RIGHT TURN STORAGE LANE, RIGHT TURN ACCELERATION LANE, AND RIGHT TURN ACCELERATION LANE TAPER. MATCH EXISTING WIDTH OF SHOULDER, WITH A 4 FEET MINIMUM, AT ALL OTHER SHOULDER LOCATIONS.
6. USE A 16 FEET MINIMUM ACCEPTANCE LANE FOR 50 FEET WITH A 15:1 TAPER IF RIGHT TURN ACCELERATION LANE IS NOT USED.
7. STANDARDS SHOWN ARE RECOMMENDED VALUES. EXCEED STANDARDS IF CONDITIONS PERMIT.
8. $G = 140'$ FOR SPEEDS 45 TO 50 MPH
 $G = 180'$ FOR SPEEDS 55 MPH AND ABOVE
9. INCREASE VEHICLE STORAGE LENGTH AS DETERMINED BY ENGINEERING STUDY OR REGION TRAFFIC ENGINEER.
10. SEE STD DWG ST 5 FOR INFORMATION ON STRIPING DETAILS.
11. FOR POSTED SPEED ≥ 45 MPH $L = WS$
 L = TAPER LENGTH IN FEET
 W = WIDTH OF OFFSET IN FEET
 S = SPEED IN MPH
12. PROVIDE A TWO WAY LEFT TURN LANE CONNECTING ADJACENT ACCESS POINTS WHEN THEIR TAPERS OVERLAP, OR AS REQUIRED BY THE REGION TRAFFIC ENGINEER.
13. OPTIONAL USE OF W4-2L, LEFT LANE ENDS SIGN, AT A DISTANCE "D" UPSTREAM FROM THE BEGINNING OF THE TAPER.



LEFT TURN ACCELERATION DETAIL

REVISIONS

~~UTAH DEPARTMENT OF TRANSPORTATION~~
~~STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION~~

TYPICAL RURAL
2 LANE ROAD
"TEE" INTERSECTION
(HIGH SPEED)

STD DWG
DD 14A

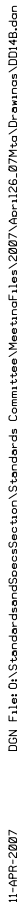
REMARKS

NO.	DATE	APPR.
-----	------	-------

MAR.22,2006	DATE
MAR.22,2006	DATE

DEPUTY DIRECTOR

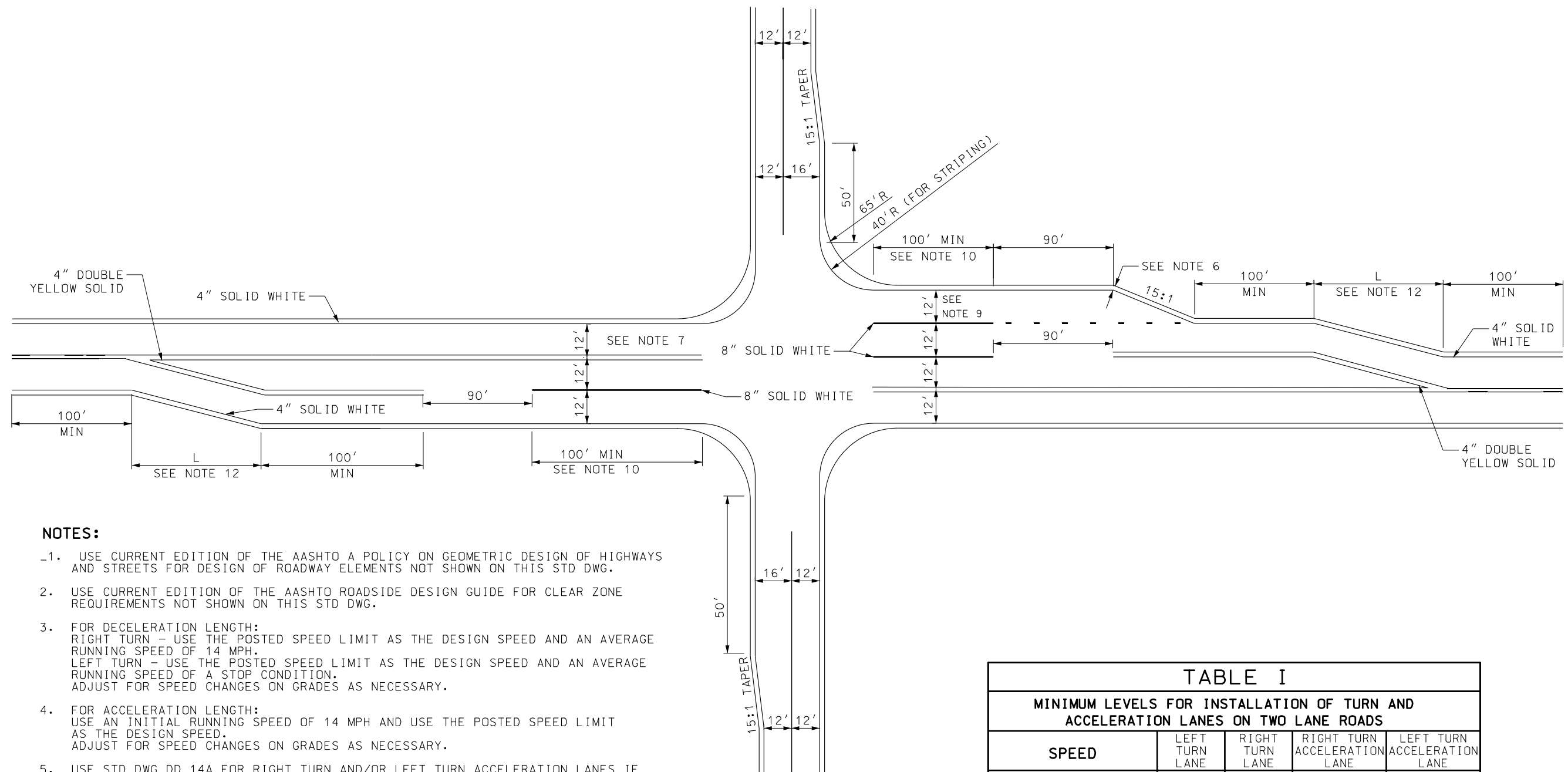
STANDARD DRAWING TITLE



1. USE CURRENT EDITION OF THE AASHTO A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS FOR DESIGN OF ROADWAY ELEMENTS NOT SHOWN ON THIS STD DWG.
2. USE CURRENT EDITION OF THE AASHTO ROADSIDE DESIGN GUIDE FOR CLEAR ZONE REQUIREMENTS NOT SHOWN ON THIS STD DWG.
3. USE 4 FEET MINIMUM SHOULDER FOR RIGHT TURN DECELERATION LANE TAPER AND RIGHT TURN STORAGE LANE. MATCH EXISTING WIDTH OF SHOULDER, WITH A 4 FEET MINIMUM, AT ALL OTHER SHOULDER LOCATIONS.
4. STANDARDS SHOWN ARE RECOMMENDED VALUES. EXCEED STANDARDS IF CONDITIONS PERMIT.
5. USE STD DWG DD 14A FOR RIGHT TURN AND/OR LEFT TURN ACCELERATION LANES IF REQUIRED. USE "D" VALUES IN THIS STD DWG FOR DESIGN.
6. USE A 16 FEET MINIMUM ACCEPTANCE LANE FOR 50 FEET WITH A 15:1 TAPER WHEN RIGHT TURN ACCELERATION LANE IS NOT USED.
7. 12' LANE WIDTH DESIRABLE
10' MINIMUM LOW VOLUME.
8. SEE STD DWG ST 5 FOR INFORMATION ON STRIPING DETAILS.
9. FOR POSTED SPEED ≤ 40 MPH, USE $L = \frac{WS^2}{60}$
L = TAPER LENGTH IN FEET
W = WIDTH OF OFFSET IN FEET
S = SPEED IN MPH
10. PROVIDE A TWO WAY LEFT TURN LANE CONNECTING ADJACENT ACCESS POINTS WHEN THEIR TAPERS OVERLAP, OR AS REQUIRED BY THE REGION TRAFFIC ENGINEER.
11. INCREASE VEHICLE STORAGE LENGTH AS DETERMINED BY ENGINEERING STUDY OR REGION TRAFFIC ENGINEER.

VPH= VEHICLES PER HOUR IN ANY ONE HOUR PERIOD IN PASSENGER
CAR EQUIVALENTS.
* SEE NOTE 5.

[illegible]



NOTES:

1. USE CURRENT EDITION OF THE AASHTO A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS FOR DESIGN OF ROADWAY ELEMENTS NOT SHOWN ON THIS STD DWG.
2. USE CURRENT EDITION OF THE AASHTO ROADSIDE DESIGN GUIDE FOR CLEAR ZONE REQUIREMENTS NOT SHOWN ON THIS STD DWG.
3. FOR DECELERATION LENGTH:
RIGHT TURN - USE THE POSTED SPEED LIMIT AS THE DESIGN SPEED AND AN AVERAGE RUNNING SPEED OF 14 MPH.
LEFT TURN - USE THE POSTED SPEED LIMIT AS THE DESIGN SPEED AND AN AVERAGE RUNNING SPEED OF A STOP CONDITION.
ADJUST FOR SPEED CHANGES ON GRADES AS NECESSARY.
4. FOR ACCELERATION LENGTH:
USE AN INITIAL RUNNING SPEED OF 14 MPH AND USE THE POSTED SPEED LIMIT AS THE DESIGN SPEED.
ADJUST FOR SPEED CHANGES ON GRADES AS NECESSARY.
5. USE STD DWG DD 14A FOR RIGHT TURN AND/OR LEFT TURN ACCELERATION LANES IF REQUIRED. USE "D" VALUES IN THIS STD DWG FOR DESIGN.
6. USE 4 FEET MINIMUM SHOULDER FOR RIGHT TURN DECELERATION LANE TAPER, RIGHT TURN STORAGE LANE, RIGHT TURN ACCELERATION LANE, AND RIGHT TURN ACCELERATION LANE TAPER. MATCH EXISTING WIDTH OF SHOULDER, WITH A 4 FEET MINIMUM, AT ALL OTHER SHOULDER LOCATIONS.
7. USE A 16 FEET MINIMUM ACCEPTANCE LANE FOR 50 FEET WITH A 15:1 TAPER WHEN RIGHT TURN ACCELERATION LANE IS NOT USED.
8. STANDARDS SHOWN ARE RECOMMENDED VALUES. EXCEED STANDARDS IF CONDITIONS PERMIT.
9. 12' LANE WIDTH DESIRABLE
10' MINIMUM LOW VOLUME LOW SPEED.
10. INCREASE VEHICLE STORAGE LENGTH AS DETERMINED BY ENGINEERING STUDY OR REGION TRAFFIC ENGINEER.
11. SEE STD DWG ST 5 FOR INFORMATION ON STRIPING DETAILS.
12. FOR POSTED SPEED ≤ 40 MPH $L = \frac{WS^2}{60}$
L = TAPER LENGTH IN FEET
W = WIDTH OF OFFSET IN FEET
S = SPEED IN MPH
13. PROVIDE A TWO WAY LEFT TURN LANE CONNECTING ADJACENT ACCESS POINTS WHEN THEIR TAPERS OVERLAP, OR AS REQUIRED BY THE REGION TRAFFIC ENGINEER.

TABLE I	
MINIMUM LEVELS FOR INSTALLATION OF TURN AND ACCELERATION LANES ON TWO LANE ROADS	

SPEED	LEFT TURN LANE	RIGHT TURN LANE	RIGHT TURN ACCELERATION LANE	LEFT TURN ACCELERATION LANE
40 MPH AND LESS	25 VPH	50 VPH	* OPTIONAL	* OPTIONAL

VPH= VEHICLES PER HOUR IN ANY ONE HOUR PERIOD IN PASSENGER
CAR EQUIVALENTS.
* SEE NOTE 9.

"D" DISTANCE		
SPEED MPH	"D" FEET	3/4 "D" FEET
25	325	245
30	450	340
35	550	415
40	650	490

REVISIONS

~~UTAH DEPARTMENT OF TRANSPORTATION
STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION
SHEET 16000-1-100~~

MAR.22,2006

MAR.22.2006

TYPICAL RURAL
2 LANE ROAD
INTERSECTION
(LOW SPEED)

STANDARD DRAWING TITLE

STD DWG
DD 15B

Doc
Page
345

Standards Committee Submittal Sheet

Name of preparer: Barry Axelrod

Title/Position of preparer: Technical Writer

Specification/Drawing/Item Title: All Specifications

Specification/Drawing Number: N/A

Enter appropriate priority level:

(See last page for explanation) **2008**

Sheet not required on editorial or minor changes to standards. Check with Standards Section.

NOTES:

1. All Submittal Sheets must be completed and sent to the Standards and Specifications Section by the Standards Committee suspense date as shown on the Web.
(<http://www.udot.utah.gov/index.php/m=c/tid=303>)
2. The Preparer of the Submittal Sheet or the Standards Committee member (or authorized substitute) responsible for the submittal must be present at the Standards Committee meeting and capable of discussing and answering all questions related to the submittal. The item will be postponed to a later meeting if one of these people is not present.
3. Notify the Standards and Specifications Section immediately of any changes that impact the presentation to include absence of sponsor or delay in presentation.

Complete the following: (Use additional pages as needed.)

- A. Why? Detail the reason for changing the Standard (Specification or Drawing), what has initiated a new Standard, or what has caused a new or changed item of interest.

Degen Lewis recommended a change in formatting concept for selected articles in Part 1 of our Standard Specifications. Currently only articles that have specific information are included. The suggested change is to standardize the format with selected articles pre-set. Degen initially suggested all specifications have a placeholder article for "submittals." On further discussion the decision was made to recommend five pre-set articles (Section Includes, Related Sections, References, Definitions, and Submittals). The numbering will generally be 1.1 to 1.5 but there are some more obscure subjects that, if needed, can possibly go between these pre-set articles. If one of these sections has nothing then that will be stated.

This will give us a single point to look to in every specification. Hopefully it will also make it easier for some sort of automatic list generation of all submittals required on a project. The Specification Writers' Guide will be updated to reflect this "model" format as well.

See example at end.

- B. How is Measurement and Payment handled? Existing (from the measurement and payment document), modified, or new measurement and payment to be included with all Standard Specifications or Supplemental Specifications.

Not applicable.

- C. Stakeholder Notification for AGC and ACEC:

Not applicable at this time. The only direct impact will be for design consultants creating Special Provisions. They will have to comply with our formatting requirements.

- D. Stakeholders? From the list provided, document the stakeholders contacted, detailing: the company, name of contact, how contacted (by phone, email, hard copy, or in person), concerns, and comments of the change. Stakeholders:

Not applicable at this time. The only direct impact will be for designs creating Special Provisions. They will have to comply with our formatting requirements.

- E. Other impacted areas, systems, or personnel. (Consider all impacts and possible changes to these areas during the preparation process. Coordinate with all appropriate areas for the respective item. List all impacts and action taken.)

1. Minimum Sampling and Testing Guide (MS&T Guide)

Not applicable.

2. Business Systems (Electronic Bid System, Project Development Business System, Electronic Program Management, Computer-Aided Drafting and Design, etc.)

Not applicable.

3. Implementation Plan (Provide detailed instructions on how the subject item will be implemented to include notification of all interested parties and training requirements.)

The Standards and Specifications Section will update the Specification Writers' Guide with all required formatting information and examples. Training for region personnel will take place during the spring/summer semi-annual trip to each region by the Section scheduled for the end of May and beginning of June. Consultant Designers will be updated through information posted on our web site.

The 2008 version will be updated using this standard.

F. Costs? (Estimates are acceptable.)

1. Additional costs to average bid item price.

Not applicable.

2. Operational (For example, maintenance, materials, equipment, labor, administrative, programming).

Not applicable.

3. Life cycle cost.

Not applicable.

G. Benefits? (Provide details that can be used to complete a Cost – Benefit Analysis.) (Estimates are acceptable.) (If no costs, what is the benefit of making this change?)

Standardize all sections to information is easier to find. This will eliminate some information being put in the wrong part of a section.

H. Safety Impacts?

Not applicable.

I. History? Address issues relating to the current usage of the item and past reviews, approvals, and/or disapprovals.

Related to Benefits where information is spread out in several areas of a section.

Priority Explanation

Enter the appropriate priority in the box on the first page of the document.

Priority 1 Upon posting, this impacts all projects in construction and design with a Change Order, Addenda, and immediate change to projects being advertised.

Priority 2 Upon posting, this impacts projects being advertised.

Priority 3 Upon posting, the approved standard takes effect **four weeks** later for projects being advertised.

Example of Standard Specification as it would appear in the Specification Writers' Guide.
Formats for Supplemental Specifications and Special Provision would be updated to match.

SECTION 00000

TITLE HERE

PART 1 GENERAL

1.1 SECTION INCLUDES

A.

B.

1.2 RELATED SECTIONS

A. Section 00000: Title here

B. Repeat for each specification referenced in the body of this section

or

A. None (This applies if there are no Related Sections for this section.)

1.3 REFERENCES

A. AASHTO M 288: Geotextile Specification for Highway Applications

B. ASTM A 252: Welded and Seamless Steel Pipe Piles

C. Repeat for each item referenced in the body of this section

D. List all AASHTO references first, followed by ASTM references, and finally by all others as applicable. List each document or reference only once even if a document is listed several times in the body of the section, each referring to a different chapter or section.

or

A. None (This applies if there are no required definitions for this section.)

1.4 DEFINITIONS

A. List alphabetically as needed.

B. Repeat for each required definition.

or

A. None (This applies if there are no required definitions for this section.)

1.5 SUBMITTALS

A. List as needed.

B. Repeat for each required submittal or to expand as needed.

or

A. None (This applies if there are no required submittals for this section.)

1.6 TITLE (Continue as needed)

PART 2 PRODUCTS

2.1 TITLE AS APPLICABLE

A.

B.

2.2 TITLE AS APPLICABLE (Continue as needed)

A.

B.

PART 3 EXECUTION

3.1 TITLE AS APPLICABLE

A.

B.

3.2 TITLE AS APPLICABLE (Continue as needed)

A.

B.

END OF SECTION

Action Item Update for April 26, 2007 Standards Committee Meeting

(As of April 10, 2007)

Item 1, Rumble Strips: New target date was set to April 2007 meeting during the February 2007 meeting. Scheduled on the agenda for approval of Supplemental Drawings PV 8 and final review/approval of the policy.

Item 2, New Drawing of Three-legged and Four-Legged Intersection: New target date was set to April 2007 meeting during the February 2007 meeting. Scheduled on the agenda. The drawings have been developed and coordination complete.

Item 3, Supplemental Specification 01554M, Traffic Control: New target date was set to April 2007 meeting during the February 2007 meeting. From John Leonard: We will incorporate it as requested by the Standards Committee into the Traffic Spec 01554. This will be done in the review and modifications to this spec, before the August deadline.

No new Action Log items from the February 2007 meeting.

End of Agenda Package